NATIONAL PETROLEUM NEWS

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# Patent Club Making Joint Defense to Suit Brought by U. S. Government

By Paul Truesdell
N. P. N. Staff Writer

NEW YORK, Oct. 14—THE Patent Club is making a unit defense to the suit brought by the United States government challenging the validity of the cracking patents owned by the club members, and charging that restrictions on marketing of cracked products, which in some cases made a condition of licensing Independent refiners to use their cracking processes on a royalty basis, constituted an illegal restraint of trade.

Members of the Patent Club are: Standard of Indiana, owner of the Burton, Clark, Humphreys, and other patents; The Texas Co., owner of the Adams, Holmes-Manley and Behimer patents; Standard of New Jersey, owner of the Ellis and other patents and the Gasoline Products Co., owner of the Cross patents. The M. W. Kellogg Co., formerly manufacturer and selling agent of the Fleming cracking process, but now acting in the same capacity for the Cross process, is also a defendant.

The suit was originally filed June 25, 1924, in the federal district court in Chicago. Members of the Patent Club were named as primary defendants and some 45 oil companies who are licensees of their processes as secondary defendants. Taking of testimony so far has been entirely before a master.

Russell Wiles of the law firm of Dyrenforth, Lee, Chritton & Wiles, of Chicago, patent attorneys for the Standard of Indiana, is the legal general on whom the club is leaning so far in the case.

Robert E. Wilson, director of research of the Standard of Indiana, is the expert witness on whom the club relies to show the court that the patents concerned are valid because they cover real inventions and discoveries and not mere adaptations of processes and apparatus old in the art to the manufacture of synthetic gasoline.

Alexander B. Royce of New York, special assistant to the attorney general handling anti-trust law cases, is in charge for the government, assisted by Benjamin T. Rauber, James A. Fowler, and Horace Lamb.

Hearing of the defendants' side of the case began Oct. 11 before Special Master Charles Martindale of Indianapolis. The hearings are being held in a room in the Standard Oil building, 26 Broadway.

## Cracking Patents on Trial

***Challenging the validity of some of the principal gasoline cracking patents, and the manner in which they have been licensed, the federal government brought them into court. Testimony in the case is now being taken.***

***The status of the Independent refining industry may be greatly changed, depending upon the outcome of this suit.***

***Realizing the importance to every refiner of this litigation, National Petroleum News has dispatched Paul Truesdell, its staff man who writes of refining developments, to cover this trial. He will follow and write of important phases of the case as they come up.***

### Government Charges Fraud

IN addition to the suit charging restraint of trade, the government also filed another suit against Joseph H. Adams and The Texas Co. charging that fraud was committed on the Patent Examiners in obtaining the Adams patents.

Concerning the fraud angle of the case, Attorney Wiles told the court the defense will seek to prove that, even if the affidavits procured by Adams were fraudulent, there was sufficient novelty and invention in certain of his other claims to justify granting him a patent apart from the claims that were challenged.

There are three other points the defense is seeking to bring out.

First, they are seeking to show that the patents under which they have been licensing the use of their processes to outside refiners and collecting royalties are based on real inventions.

Second, they are trying to discredit as an oil expert the government's expert witness, R. H. McKee, professor of chemical engineering at Columbia university.

Third, they are apparently trying to show that, because a number of investigators outside the organizations of the four big companies had shown at least a glimmer of invention in some of their patents and patent applications and must be reckoned with, therefore some kind of agreement among the defendants concerning their own patents was necessary, as well as the acquiring of these outside patents, to prevent dire confusion and endless litigation. Thus the Patent Club was formed.

Mr. Wilson took the witness stand at the opening of the hearing Oct. 11 and has held it steadily ever since. Guided by the questioning of Attorney Wiles, he traced the evolution of the Burton process, stated wherein he considers that

the patents obtained by Burton, Clark, Humphreys and others constitute valid patents, and explained wherein, in his opinion, the patents cited against the Standard of Indiana do not show anticipation of the essential inventions of Burton and his colleagues.

Two days were spent in tracing the development of the Burton process from the earliest type of apparatus always in the direction of more efficient operation, the various improvements made in construction and operation and so on. Today his testimony was directed to show that the development of the Holmes-Manley process was just another step toward the ideal of continuous cracking operation which Burton and his associates had pursued with only partial success for years.

In describing the evolution of the Burton process, Mr. Wilson stated that the original battery of 60 Burton shell stills built at Whiting in 1912 were in operation up to a few months ago, making cracked gasoline. They were then dismantled.

### Described Process in Detail

AFTER an adjournment to the offices of The Texas Co., 17 Battery place, where he explained a model of a Holmes-Manley unit for the benefit of the master, Mr. Wilson described the operation of the process in detail. He stated that, through the use of four vertical stills, fired mildly around the sides instead of under the bottom, and by the use of scrapers to minimize the formation of coke on the sides of the stills and to keep it of even thickness, Holmes and Manley have developed a truly continuous cracking process, even though it has to be shut down at long intervals for cleaning out.

He said that installations having most of the essential features of the Holmes-Manley process, but not called by that name, are being operated extensively at the Whiting plant of the Standard of Indiana.

He then went on to describe in detail construction and operation of the tube and tank type of cracking processes, known as the Cross and the Tube and Tank. Cracking in pipe coils is old in the art, he said, but was impracticable because of coking and high gas losses until Cross and Ellis discovered that, by putting a reaction chamber or soaking drum between the heating coil and the tar separator, the cracking could be accomplished away from the heat of the fire with minimum fire hazard and without coking up the tubes.

As an example of an inventor who discovers something really new which, although small in itself, affects operations in the art to an important degree, Mr. Wilson cited C. S. Palmer. He stated Palmer was the first man to discover, or at least to disclose the fact, that cracking could be accomplished entirely independent of distillation. He said a body of oil, bottled up in a sealed container and kept at the right pressure and temperature for cracking will crack although no distillation is possible. Palmer took out a patent covering this point, which was bought by the Standard of Indiana.

Mr. Wilson said that use of this method is a regular part of the operation of the Burton process by the Standard of Indiana. This is called the "digesting step" in the cycle of a Burton still. Gas is backed in to prevent distillation during the time the still is being brought up to distilling temperature. Just before that temperature is reached, the fires under the still are slowed down to prolong the digesting period before distillation begins. Considerable cracking takes place during this period, this greatly improves the quality of the distillate that first comes over as compared with the quality if distillation is started simultaneously with cracking.

Cracking without distillation is also practiced in the Cross process, Dr. Cross claiming that no distillation whatever takes place in his heating tubes or reaction chamber, while cracking does take place.

### Attack Government Expert

THE two-fold attack on the qualifications of the government's expert witness came in discussion of the Adams patents. It was called to Mr. Wilson's attention by Attorney Wiles that Professor McKee, in his previous examination, had stated the Adams patent in question covered a vapor phase process. He based this opinion on the fact that Adams had specified that his cracking vessel operated at a bright red heat.

Professor McKee had stated that oil could not remain liquid in a vessel red hot and said further that the temperature of the oil would always be within 10 per cent of the temperature of the heating surface. Mr. Wilson disagreed with Professor McKee. He stated, in the first place, that Adams plainly stated that his cracking vessel contained liquid, showed a liquid level and a gage glass on his equipment.

Furthermore, he asserted that the heating surfaces could be red hot and still the oil in it not only liquid but relatively cold.

To prove his point, Mr. Wilson showed the court how this was possible. He had a six-volt battery hooked up to an electrode suspended in a beaker of white medicinal oil. As the current was passed through a small piece of tungsten wire about an inch long in the electrode, the wire became incandescent and remained so for about 30 seconds.

Mr. Wilson then invited those in the court to feel the sides of the beaker and they found the oil was still cold.

Another point of attack came in discussion of graphite as a possible material for making a container for cracking oil. Professor McKee had stated that a graphite would not hold any considerable pressure at high temperature. He based this assertion on his own experience when he had failed in his effort to pull a vacuum on a graphite vessel because of the porosity of the material. His position was that, if a graphite container could not keep air out it could not keep oil in. Mr. Wiles asked Mr. Wilson whether he agreed with this.

Mr. Wilson replied that he did not, that there was no parallel between exhausting the air from a vessel and holding that vessel under pressure. He stated that air, being a very fluid medium, would leak in through extremely small holes and there was nothing to close the pores against its entrance.

On the other hand, he said, oil is less fluid than air and that, if oil was placed in the graphite vessel at the temperature prescribed by Adams, it would immediately clog up the pores with coke which would effectively block the small leaks and keep the pressure.

He stated, in answer to a further question of Mr. Wiles, that the effectiveness of coke in stopping small leaks in a cracking still was well known. "That is the one place where coke is helpful in a cracking process," he said.

For the purpose of making clear to the master, who is not familiar with the oil industry, the essential features of the refining business and giving him a background for the testimony to follow, the first day of the hearing was devoted to a description of refining in general.

Under questioning of Attorney Wiles, Mr. Wilson described the ordinary re-

## Index To Coming Meetings

**National Petroleum Marketers Association, Atlantic City. Oct. 26, 27, 28.**

**Petroleum Section, National Safety Council, Tuller Hotel, Detroit, Mich., Oct. 26, 27, 28.**

**Virginia Independent Oil Men's Ass'n., Richmond, Va., Nov. 10.**

**Wisconsin Independent Oil Jobbers' Association, Assembly Chamber, State Capitol, Nov. 11.**

**American Association of Petroleum Geologists, New York City, Nov. 15, 16, 17.**

**American Oil Men's Association, Congress Hotel, Chicago, Nov. 16, 17, 18.**

**Texas Independent Oil Men's Association, San Antonio, Nov. 12 and 13.**

**Rocky Mountain Oil & Gas Association, Montana Chapter, Great Falls, Mont., Dec. 1, 2, 3.**

**American Petroleum Institute, annual meeting Mayo Hotel, Tulsa, Dec. 7, 8, 9.**

**Michigan Independent Oil Men's Association, Detroit, Feb. 10 and 11, 1927.**

**American Oil Burner Association, Broadway Auditorium, Buffalo, N. Y., Apr. 5, 6, 7.**

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fining operations of skimming, running down to coke, and so on. Four-ounce bottles containing samples of the various products discussed and described were produced in court to show the master what they looked like.

The second day of the hearing, Mr. Wilson described the operation of the first Burton stills. He admitted that others before Burton had known how to crack oil to a slight extent, but he declared Burton was the first to discover a "clean stock" that could be cracked in a still of commercial size to make a good yield of gasoline and yet maintain a "black bottom" on the still. In other words, Burton found that gas oil could be cracked at the temperatures he specified in his patent application on a profitable scale and without danger of blowing up the still. With the stocks disclosed in the prior art pressure distillation processes, the formation of coke on the still bottom was altogether too rapid both from the standpoint of operating efficiency and fire hazard, said the witness.

### Rerunning the Bottoms

MR. WILSON said that Dr. Burton's next step was the discovery of the possibilities of rerunning the bottoms from the cracking stills in atmospheric pressure stills and obtaining additional clean cracking stock. He found that, by withdrawing the tar or bottoms remaining after a cycle had been run in the pressure stills and by running this pressure tar down to coke in another still without pressure, he could get off overhead a large amount of distillate suitable for recycling. This practically doubled the amount of cracking stock obtained from the crude.

It was generally held at that time, Mr. Wilson said, that coke was formed only on the bottom sheet of the still which was in contact with the fire. However, research work developed the fact that the coke was formed in the body of the oil and settled by gravity to the still bottom, where it quickly burned on making the danger of hot spots and splitting of the fire sheet very great.

One of the earliest important steps in the improvement of the Burton process, the witness stated, was the development by R. G. Humphreys of the false bottom in the still, which is covered by another patent. This false bottom caught the coke settling out from the body of the oil and held it off the still bottom, thereby permitting longer runs, although the trouble was not entirely overcome, because the coke formed under the false bottom and baked on the bottom of the still. The false bottom was, however, a great improvement.

The next great step in advance, said the witness, was Edgar M. Clark's invention of the tube still. This consisted in suspending a bank of tubes by two hollow legs from the bottom of a large drum, heating the oil in the tubes and allowing the cracking reaction to take place in the drum.

The advantages of this arrangement were many, according to Mr. Wilson. In the first place, the oil being kept in constant circulation from and to the body of oil in the drum, formation of coke in the tubes was kept to a minimum by the velocity of the oil. The coke was formed in the drum, which was not in contact with the fire, so that danger of hot spots and rupture of the still bottom was eliminated. Sometimes a tube would split, but this kind of fire was much less dangerous than when the whole body of oil in a shell still took fire.

### Pump Not Necessary

MR. CLARK'S original idea was to use a pump to circulate the oil through the tubes, but it was found in practice that this was unnecessary, that the thermo-syphon action caused by heating the oil in one end of the tubes caused circulation of sufficient velocity. In this invention, the drum was insulated to maintain the cracking temperature, which was constantly being kept up by recirculation of the oil through the tubes.

The use of this invention, said Mr. Wilson, greatly increased the throughput of the cracking plant through the use of larger stills and because it allowed the feeding in of fresh charging stock during the run, which had not been possible before. Whereas the original Burton still had contained only 8250 gallons, which was run down by the batch method, the new tube stills contained a charge of 13,000 gallons at the beginning of a run and about 7,000 gallons was fed in during the run.

The patent of De Clerq was cited against this Clark patent. Mr. Wilson stated that De Clerq was not in conflict with Clark because the former specified his equipment, which roughly resembled Clark's in mechanical design, purely for heating up tar to the distillation temperature at atmospheric pressure. His patent did not mention the use of his invention for pressure distillation and Mr. Wilson asserted that it was evident from the patent drawings that it would not have stood pressure. However, De Clerq mentioned the reduction of fire hazard with the circulating tube arrangement, as compared with that involved in heating the tar direct in the shell still.

Another difference, Mr. Wilson said, between the De Clerq patent and the Clark process was that in the former, the back circulating leg through which the oil passed from the still into the heating tubes had its opening flush with the bottom of the still, whereas Clark had the opening in the side of the still at least a foot above the bottom. This was to draw the oil from above the zone where the coke settled out and prevent the coke from being drawn into the tubes. He said De Clerq could not have used his apparatus for cracking because, drawing the oil from the bottom of the still, he would have carried the coke into the tubes where it would have burned on the inner surface.

Then Mr. Wilson, under the questioning of Mr. Wiles, went on to describe the evolution of the Humphreys run-back, one of the great improvements made to the Burton process.

### The Humphreys Run-Back

THE Humphreys run-back accomplished in a rather crude way what the bubble tower was later to accomplish in a much more efficient way, that is, fractionation of the overhead and stripping of the reflux. Before the development of the run-back, when the cracking stills were fired to a point to give large cracking rate and large throughput, not only the gasoline vapors but a large volume of kerosene vapors were carried overhead, putting a strain on the condensers and also necessitating rerunning of all the pressure distillate at added expense.

The purpose of the run-back was to permit keeping the stills at a temperature which would give a high cracking rate and still prevent the heavier ends from being carried over. On the stills first used, the runback consisted of two vapor lines 12 inches in diameter and 40 feet long, slanting upward at a considerable angle from the stills to the condensers.

Cooled by the atmosphere, the large vapor lines cooled the vapors and progressively condensed the heavier ends and returned them to the still, only the light gasoline vapors escaping to the condenser. Whatever entrained oil was carried over was knocked back as soon as it entered the vapor lines and the heaviest vapors, being farthest above atmospheric temperature, condensed near the still and were dropped back

A little lighter vapors condensed a little further along in the line and so on. Besides condensing the heavy ends and returning them to the still, the big vapor lines accomplished another purpose. As the condensate, containing considerable amounts of gasoline fractions, flowed backward toward the still, they passed counter current to the stream of vapors going to the condenser and the hot vapors picked up the lightest ends of the liquid and carried them over, thus stripping them fairly effectively of their gasoline content before they returned to the still. It was found that, in order to accomplish the condensation desired, it was necessary to have an area in the vapor lines larger than the area of the still exposed to the fire

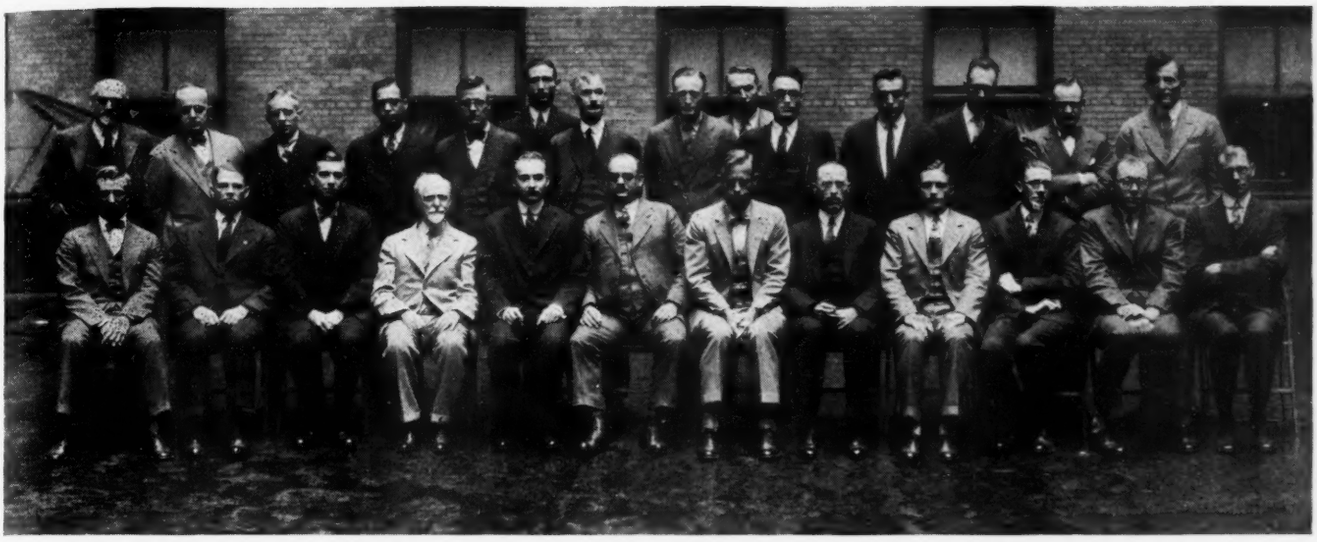
As the stills increased in size the problem of obtaining sufficient area in

**Greasing by the Calendar**
(Oct. 27th Issue)

BELIEVING that force of habit is as strong as the warning of the speedometer reading, one oil company tries to bring its customers to have their cars serviced regularly once or oftener a month.

It has a monthly service contract by which the customer pays a flat price for his oiling, greasing and washing.

Details of his arrangement are given in a special story in the Oct. 27th issue.



*A group of Committee D-2 members at the Cleveland meeting Oct. 14, 15 and 16. Officers and chairmen of subcommittees shown in the picture are: Front row, left to right, E. N. Hurlburt, chairman subcommittee on public relations. Dr. T. G. Delbridge, chairman subcommittee on gasoline, J. B. Rather chairman subcommittee on paraffin wax. Dr. F. R. Baxter, chairman subcommittee on carbon residue, K. G. Mackenzie, vice chairman of Committee D-2. F. A Hull chairman Committee D-2. Dr. R. P. Anderson, secretary and technologist American Petroleum Institute. Ernest Johansen chairman subcommittee on sulfur determination and differentiation. second to the right from Mr. Johansen is A. Ludlow Clayden, chairman subcommittee on oxidation at high temperatures. Back row, seventh from the left, Dr. A. E. Flowers, chairman of the new subcommittee on sampling and gauging, fifth to the right from Dr Flowers is H. T. Kennedy of the Bureau of Standards and on the right end is A. J. Kramer, representing the Federal Specifications Board.*

the vapor lines was solved, instead of enlarging the lines to unreasonable and unwieldly sizes, by the invention of the Moore radiator, the familiar "harp" used in many refineries on atmospheric pressure stills. This furnished the needed additional cooling surface without taking up much space.

### Feed Still Through Run-Back

THEN Clark devised another improvement. This was the idea of feeding the charging stock into the system during the run through the run-back, instead of directly into the still. This accomplished two useful purposes, Mr. Wilson said. One was the drying of the charging stock. That is, the water that might be in the oil was evaporated before it reached the still, and the other was the heating up of the charging stock, thus putting to useful work some of the heat from the liquid and vapor in the run-back that previously had been dissipated into the air.

The Dewar and Redwood had been cited against the Humphreys run-back patent. Mr. Wilson stated that the use of a still head for refluxing into the still, such as was mentioned by Dewar and Redwood, was useful mostly for knocking back entrained oil that primed over and that such a still head would ordinarily return a small amount of the heavy vapors going over, whereas the Humphreys run-back refluxes from 80 to 90 per cent of the vapor that goes over from the still.

Mr. Wilson stated that one of the first problems he tackled when he went to the Standard of Indiana from the Massachusetts Institute of Technology in 1922, was to measure exactly the percentage of the vapors condensed and returned to the still by the run-back. This had been the subject of conflicting estimates by the Standard operating men up to that time.

In later installations, the witness stated, the Humphreys run-back has been replaced by the Lewis and Cook bubble tower. This, according to Mr. Wilson, accomplishes two purposes besides scrubbing the reflux oil more efficiently. First, the towers act as stabilizers of the operation of the stills. The pools of liquid in the bubble trays keep the composition of the distillate constant during temporary fluctuations of the stills due to careless firing, special wind conditions and so on. Second, holding the liquid in the tower at the high temperature tends to polymerize the gum forming constituents in the cracked vapors, removing them altogether or at least making the cracked gasoline more easily treated to produce a gum-free motor fuel.

The old run-back did not stabilize still operation nor did it polymerize the gum forming substances. The Barbet patent had been cited against the Lewis and Cook bubble tower patent, but Mr. Wilson stated that, while the Barber tower obtained good fractionation, it operated at atmospheric pressure and its inventor was apparently ignorant of the advantages of using the bubble tower under pressure. It is the pressure that keeps the temperature high enough to bring about the degree of polymerization obtained in the towers in connection with the Burton system, he said.

Asked whether a packed tower would not accomplish the same results as the bubble tower, Mr. Wilson stated that it would not. He had once thought, he said, that a packed tower, which is cheaper to build than a bubble tower would do the work as well. One was built at the Standard plant and it was found that, although the fractionation was good, the tower did not give the feature of still stabilization nor the polymerizing action that is afforded by the tower containing trays of liquid.

He described also the gas pressure equalizing system invented by Clark that is a feature of the Burton system whereby excess gas generated by stills far along in their runs can be used to build up quickly the required pressure on stills that are just starting up, thereby saving time and fuel.

### Takes Up Adams Patent

THE sessions on Oct. 15 were devoted to the introduction of testimony on the Adams patents, evidently designed to show that the ideas disclosed by Adams overlapped the Burton, Cross and Ellis patents and therefore made it almost imperative for the owners of these various groups of patents to come to an understanding, to permit them all to develop their processes along the most efficient lines without danger of infringement suits.

Mr. Wilson stated that Adams was the first man to disclose, in connection with bulk pressure distillation processes, these seven features:

1—Indirect slight heating of a large bulk of oil away from the heat of the main fire.

2—Condensation and separation of the gasoline under still pressure.

3—Continuously feeding in charging stock and withdrawing the tar or residue, to keep the composition of the material in the system substantially constant.

4—Application of heat to the intermediate portion of a vertical still below the liquid level.

5—Use of mechanically operated carbon scrapers to keep the formation of coke uniform on the walls of the still, preventing asphaltic material from building up and coking on the coke layer formed directly on the walls of the still; and continuously drawing off the tar and scrapings from the bottom.

6—Use of a plurality of vertical stills in series with a common vapor line.

7—Separate condensation of the distillate heavier than gasoline.

## Topics On Program For N. P. M. A. Meeting Atlantic City, Oct. 26, 27, 28

"1. Is big business a sound economic factor?
"2. What can we gain from uniform price laws and unfair competition legislation?
"3. Shall we work out some model laws governing unfair competition and try to have them passed in our various states, or handle it as a national problem requiring national legislation?
"4. Can the Independent branch of the industry agree on a national policy?—If not, why not?
"5. Need for uncontrolled crude oil supply and real 'common carriers.'
"6. Cost—what is it? Who knows?
"7. Anti-knock gasoline—Ethyl gas—future supply and possibilities.
"8. Anti-trust laws and other business demoralizers vs. real common sense.
"9. Have we and the public the right to demand and force open-and-above-board bookkeeping?
"10. Need for uniform gas tax laws.
"11. Does gas tax retard sales?
"12. What is the truth about crude oil supply?
"13. What future is there for the Independent?
"14. Merchandising vs. Price Cutting.
"15. What is a fair profit?

## N. P. M. A. Damage Suit Is Dismissed

CHICAGO, Oct. 18.—L. V. Nicholas, president of the National Petroleum Marketers Association, has withdrawn that organization's $1,000,000 damage suit against the Standard Oil Co. of Indiana, started last summer in the federal court at Hammond, Ind. This is the case in which the association alleged the Standard Oil Co. was carrying on a studied program of intimidation and embarrassment against the Independent Oil Men of America, the advertising and merchandising branch of the association.

The incidents which led up to the affair pivoted upon the litigation in the U. S. Patent Office popularly called the Red Crown vs. Red Hat case, wherein the Standard is contesting the association's right to use the Red Hat emblem upon the contention that it is too much like their Red Crown emblem. The association wanted the matter adjudicated quickly. The Standard's attorneys asked for a continuance, which was granted, although the association lawyers filed a protest in the case insisting upon an early hearing.

Association officials believed at the time that Standard authorities were trying to prolong the litigation and retard the progress of the Red Hat movement by keeping it in court. Hence the damage suit in federal court.

Mr. Nicholas said that he was in Washington recently, to look into the matter. He found that in continuing the case, the Commissioner of Patents dictated into the record, "There being no objection of record, the extension is granted." This led to the discovery that the association's protest against a continuance was not received by the commission until after the continuance was granted.

This action has no bearing on the patent office case. The association still is contending for its right to use Red Hat as an emblem for the nationally advertised gasoline sold by the Independent Oil Men of America. A hearing on the Standard Oil Co.'s objection to the registration of the Red Hat emblem will take place in Washington before the Commissioner of Patents Oct. 21.

### Will Talk on Ethyl Gasoline

CHICAGO, Oct. 19.—President E. W. Webb of the Ethyl Gasoline Corp., New York, is the speaker for the afternoon session, Oct. 26, of the annual convention of the National Petroleum Marketers' Association in Atlantic City. Mr. Nicholas says Mr. Webb will tell the jobbers of the progress toward making Ethyl Gasoline accessible to the whole industry.

FARMINGTON, ME.—Farmington Oil Co. has just installed a new 12,000 gallon storage tank for fuel oil, due to the fact that its business has increased 50 per cent this year, according to C. V. Bailey, manager.

### Historic Hudson's Bay Co. In New Role

(Oct. 27th Issue)

REMOTE fur trading posts in the pine forests of Canada will be oil supply depots if success accompanies the exploration for oil on this Company's vast land holdings to be undertaken by the Hudson's Bay-Marland Oil Co., controlled jointly by the E. W. Marland interests and the Hudson's Bay Co.

What the plans of this company are, and something of the history of the Hudson's Bay Co and what part it has played in Canada's development are given in a special story in the Oct. 27th issue.

## Pipe Line Earnings Greater in 1925

By Telegraph

WASHINGTON, Oct. 19.—The 37 pipe line systems engaged in interstate transportation of oil, and therefore reporting on their operations to the Interstate Commerce Commission, had a total revenue from operating their lines in 1925 of $164,644,740. The year before 36 pipe lines reported net operating revenue of $146,921,073.

Net income for 1925 was given as $88,495,026, as against $72,233,975 in 1924; and dividends paid in 1925 were $72,209,356, as against $41,151,063 in 1924. Operating expenses were $80,230,636 in 1925 and $74,655,544 the year before.

Total miles of line operated in 1925 were 70,008, and in 1924 there were 68,085 miles of line operated.

Total investment in pipe lines for 1925 was $511,087,933 and in 1924 $496,187,164.

## Cancellation of Track Storage Fee Favored

Staff Special

TULSA, Oct. 18.—Cancellation of storage charges assessed against the Skelly Oil Co. for gasoline held in tank cars on Skelly's private trackage is recommended to the Interstate Commerce Commission in a report of Examiner Harry C. Barron, just filed with the commission. The $2 a day storage charge is one which has been protested by the petroleum industry for several years. This case was prosecuted for Skelly by J. F. Lawrence, commerce counsel.

Charges were assessed under the blanket contract form which stipulated that the railroad company had a right to use the trackage for its own purpose providing the use did not interfere with the business of the owner of the trackage.

In a stipulation of facts it was shown that the trackage was within the fenced property of the company at its gasoline plants at Wynona, Okla., and Burkburnett, Texas. The railroad admitted it had never used the trackage and could not have done so without interfering with the business of the Skelly Oil Co.

### Colombian Oil to Vancouver

LOS ANGELES, CALIF., Oct. 17.—The Imperial Oil Co.'s tanker Torontolite recently unloaded 10,000 tons of Colombian crude oil at Vancouver, B. C. The Imperial operates a refinery at Vancouver. The Torontolite then picked up a cargo of fuel oil at Los Angeles Harbor for Iquique, Chile. This is supposed to be the first cargo of Colombian crude ever shipped to a Pacific Coast point.

# Pressure Restoration Chief Theme At Tulsa Meeting A. I. M. E.

By A. F. Hinton
N. P. N. Staff Writer

TULSA, Oct. 14

IF any evidence were needed that the production man of today, whether he be technically trained or not, is interested in the two subjects now of paramount importance to the industry, viz:—increasing recovery and rehabilitation of old pools, it was provided at Tulsa this week at the two-day session of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers. Overflow crowds attended each session and it was noteworthy that the attendance was not by any means composed entirely of engineers. There were many executives and field men in the audience.

John M. Lovejoy, of the Amerada Petroleum Corp., and formerly chairman of the Mid-Continent section of the A. I. M. E., presided at the morning session on the second day of the meeting. He substituted for T. E. Swigart, of the Shell Co., Los Angeles, who was unable to attend the meeting. Mr. Swigart was chairman of the program committee for the meeting and was instrumental in its success.

E. O. Bennett, chief production engineer, Marland Oil Co. of Texas, had for his subject "Methods of Increasing Oil Recovery in Mid-Continent Fields". Mr. Bennet, who formerly was with the Bureau of Mines, has studied and written much on the subject of gas-oil ratios, or, as he prefers to term it, gas factors, and he started his talk with a plea to producers to study methods of conserving gas pressure in order to lengthen the efficient and profitable life of their wells. Each well should be studied, he said, in order to determine the gas factor at which it would produce most economically and it should be so controlled as to keep the gas factor as near constant as possible. He mentioned the waste of gas incident to gauging gas wells, and told of the modern methods by which these wells could be gauged without allowing them to flow wide open with consequent loss of gas.

Another important subject for study, he said, is that of proper counterbalances for pumping wells. Wells should be weighed to determine the proper weight of counterbalance, and would perform much more efficiently when this proper weight had been provided. He also recommended that when a well starts flowing by heads an auxiliary gas lift be installed to keep the well flowing and this artificial expulsive pressure could be increased as the well's natural head goes off.

### Discusses Panhandle Problems

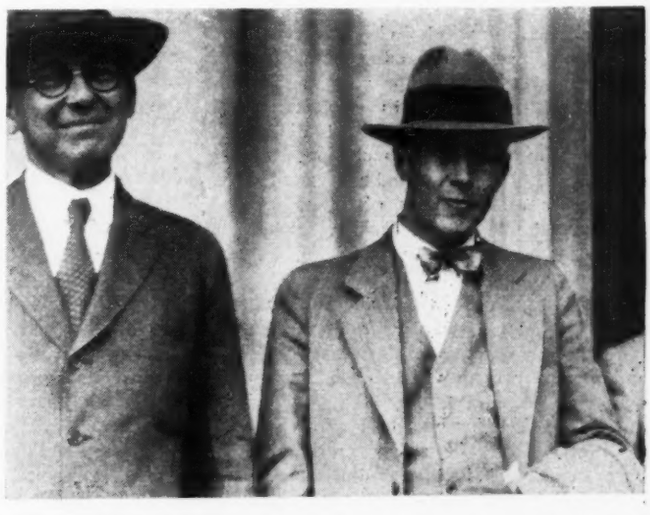
MR. BENNETT'S chief work of recent months having been in the Texas Panhandle, he demonstrated his interest in that area by giving in detail many of the problems involved in producing oil efficiently there. He cited paraffin troubles as the greatest single difficulty to be overcome in the Panhandle, and mentioned that oil in the sand there runs from 83 deg. to 90 deg. F., where ordinarily it would be expected to run from 120 deg. to 150 deg. at its depth. The crude congeals generally at from 52 to 60 deg. Rock pressure in the field is about 420 pounds, which is approximately one-half the hydrostatic head. He stated that Panhandle wells do not really flow in the ordinary sense of the term, but the oil is sprayed out by the gas. If shut in for a short time, the wells will stop flowing and are hard to get back on production.

Some companies in the Panhandle, Mr. Bennett said, are having success in using hot water or gasoline to cut paraffin from the walls of the well. He recommends the use of liners at bottom of hole to keep mud out of the hole, as this mud tends to clog up the pore spaces in the sand and is difficult to remove. Some companies are successfully using a casing-scraper which removes paraffin from inside the casing in one round trip, scraping both ways. Pumping Panhandle wells requires very frequent pulling, and is therefore very expensive. The Marland company and others, he said, are experimenting with gas lifts, but his company has had a great deal of difficulty due to expansion of gas depositing paraffin, this deposition taking place in increasing quantities toward the top of the well. They have had to pull these wells every three to five days to clean out paraffin. Introduction of live steam around the casing head has proved helpful in solving this problem.

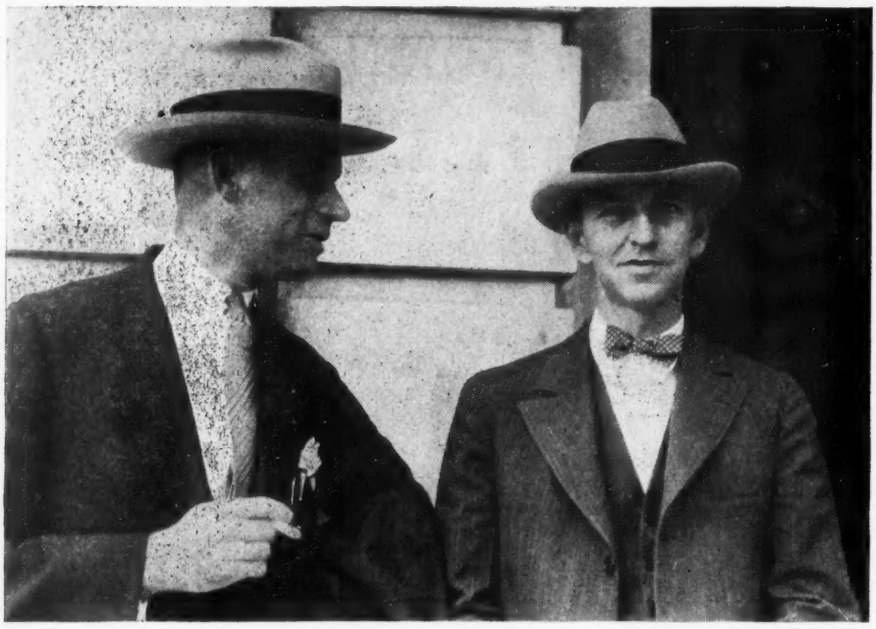
In using the gas lift, hot gas is used. This gas retaining sufficient temperature to melt paraffin in the upper 700 feet of hole, where accumulation is worst. Chemicals have not worked satisfactorily, Mr. Bennett said, and it was his company's experience that oil treated with chemical was worse than it was originally after standing for one day.

Mr. Bennett pointed out that cold weather added greatly to the difficulties

*Left to right: C. V. Millikan, petroleum engineer, Amerada Petroleum Corp., Tulsa, and Albert C. Rubel, petroleum engineer, Union Oil Co. of California. Taken at Tulsa meeting of Petroleum Division, A.I.M.E., Oct. 11 and 12, 1926.*



*Two-thirds of the California delegation at the Tulsa meeting Petroleum division, A.I.M.E. Left to right: Desaix B. Myers, assistant chief geologist, F. W. Lake, superintendent of production in Orange county. Both of them are with the Union Oil Co. of California.*



*John A. Silsbee, consulting engineer, Okmulgee, Okla., and L. D. Wooddy, production engineer, Independent Oil & Gas Co., Tulsa, talking it over at the Tulsa meeting of the Petroleum Division, A.I.M.E.*

of handling Panhandle crude, and stated that the recent cold spell in September caused a large drop in production for a few days. He said that suitable heaters should be provided at every phase of handling the crude, as the oil cannot be allowed to become cold on account of its high congealing temperature. Producers find it necssary to provide means of blowing out flow lines in case of trouble.

If the gas lift proves successful in the field, it will be the biggest factor in reducing lifting costs, which ordinarily are very high in the Panhandle. Swabbing is now the principal method of production at present, and this, he said, is expensive and inefficient. It also tends to draw water into the wells. Wells have been noted that made more or less water while being swabbed, but which made no water when the gas lift was employed. Determination of gas factor and proper use of gas will prolong the life of these wells, increase ultimate recovery and also tend to decrease lifting costs.

Electrification will help keep production up during the winter months, Mr. Bennett said. Most of the major companies will be ready to go over to electricity for drilling and pumping by about the middle of November. In conclusion, he remarked that the Panhandle has all the difficulties and troubles of other fields, and a great many more besides.

### Unit Operation on Air

JOHN E. ROTH, petroleum engineer, Tidal Oil Co., who has specialized for some years in the use of compressed air and gas as pressure restoratives, was the next speaker, and told of the application of the Marietta process to a northeastern Oklahoma pool. This was an important paper, as it set forth for the first time publicly the methods used, together with the successes and failures incident to the operation, in applying pressure to an entire Oklahoma field. It is published in full elsewhere in this issue of National Petroleum News.

Burt H. Collins, president of the Echo Oil Co., and prominent in the affairs of the Mid-Continent Oil & Gas association, told of early experiments along the lines of restoring pressure and of the progress that has been made in the science. L. L. Brundred, of the National Supply Co., also spoke on this subject during discussion of Mr. Roth's paper.

Although not included in the program as announced prior to the meeting, A. W. Ambrose, general manager of production, Empire companies, Bartlesville, was called upon to speak on the subject of restoration of pressure, and contributed a very interesting and important talk. He told of his company's experiments in pressure restoration in the Osage and then gave some of the details of operation in the El Dorado, Kans., field, where air is being used over the entire shallow field as a unit.

In one of their Osage experiments, Mr. Ambrose said, they have nine wells on a 160-acre tract, producing from a sand at 1500 feet. They are introducing gas into a key well at 250 pounds pressure. Present production is 260 barrels daily, as compared with 147 barrels before the use of artificial pressure. Cost of this installation was about $32,000, which he believes will be paid back through increased production in six months. The plant could take care of double the number of wells it is now being used on.

In another experiment in the Osage, they failed to get increased production on account of being unable to get the gas through an upper gas sand. In the first instance, cited above, there was also an upper gas sand, but they were successful in overcoming it. He considers the principal difficulty to be overcome in this work is getting the gas into the oil sand, as it tends to find its way into gas sands, where it is dissipated and does no work.

In the El Dorado field, the Empire has succeeded in bringing about unit operation under air pressure of about 600 wells on 4000 acres. These wells are producing from the 700-foot sand, with sand body 15 to 25 feet thick. The Empire has built the air plant and other operators either turn their properties over to the Empire for air operation or buy air from it and use it to suit themselves. In this manner, the pool is under central control and pressure is being restored throughout the field as a unit. The first air plant gave surprisingly good results in increasing production and encouraged the company to go ahead with the idea of putting the whole field on air.

They are now putting in three 170-h.p. Cooper compressors, and expect to put air into about 60 wells, or one air well to each 10 oil wells. Ultimately they will use more wells as air wells. Actual gauges of production are kept either on separate leases or on individual wells. In key areas, that is, in areas surrounding the air wells, individual well gauges are taken. In parts of the fields where wells on the same lease are producing from the deeper sands, production from the shallow wells operated on air is segregated so that accurate gauge of it may be kept.

Cost of putting wells on air is a material factor in the success of the operation, Mr. Ambrose said, and in their installation varied from $300 per oil well to $2,000 in one case.

### Unit Control in California

ANOTHER extemporaneous talk which contained much of interest and importance was that made by Albert C. Rubel, petroleum engineer for the Union Oil Co. of California, at Dominguez Hill. Mr. Rubel was one of three Union of California engineers who attended the meeting, and they comprised the total California delegation. Mr. Rubel told of the application of the Marietta process to the Dominguez field, which he said is a notable example of unit operation and control.

At Dominguez, Mr. Rubel said, there are about 600 proven acres under major control of two companies, the Union of California and the Shell. The Union has about 50 per cent of the acreage and the Shell has practically all the balance, which it operates on a 50-50 basis with the Union. About 50 acres in the south end are owned by the Associated Oil Co. There are also two leases owned respectively by Marland of California and the United, but both these leases are already in edge water territory and were not considered in the unit operation scheme.

Operators in this field have a drilling agreement which limits penetration into the oil horizon to 400 feet, which give them about 225 feet of oil sand to work on, the balance of the 400 feet being shale. Well spacing is uniform throughout the field, being 610 feet center to center of derricks, or four wells to 33 acres. Full and accurate records have been kept on practically every well, with cores in most cases, and this fact, together with the uniform penetration into the sand, has made it possible to have an accurate pic-

*J. S. Ross, U. S. Geological Survey, Midwest, Wyo., who attended the Tulsa meeting of the Petroleum Division, A.I.M.E.*

*Frank A. Herald, consulting geologist, Tulsa, chairman of the Mid-Continent section, A.I.M.E.*

*R. Van A. Mills, U. S. Bureau of Mines, Bartlesville, Okla., in a happy mood at Tulsa A.I.M.E. meeting.*

ture of subsurface conditions in advance of pressure restoration operations. The field was discovered in 1923, and is therefore still a comparatively new field, with production generally still in the flush stage. About 30 per cent of the wells are flowing naturally, about 30 per cent on pressure and the balance pumping.

### Careful Preparations Made

EARLY in the field's history it was decided to try the Marietta process and an extremely detailed subsurface study was made of the 90-odd wells in the pool. All records and cores were studied and a porosity determination of the sand was made. It was estimated that ultimate recovery of the field by normal methods would be about .9 per cent. There is a large surplus of residue gas in the field, which was an important factor in the pressure restoration plan. Spacing of the wells being too great to permit use of oil wells as pressure wells, it was decided to drill a "five-spot" well in the center of each four wells, in which the high-pressure gas would be introduced. This work was started two and a half years ago and completed Sept. 1, 1926 by actual introduction of gas. The new wells were allowed to produce for a time and were then shut in to await beginning of the gas drive. As showing the live condition of the field, Mr. Rubel cited the case of one of these five-spot wells which flowed 200 barrels a day for four months before being shut in, showing a rock pressure of 500 pounds. The five-spot wells were drilled simultaneously by the Union and Shell companies, and were located so as to offset each other. Both companies started gas into the wells at the same time, and to date about 75 million cubic feet of gas have been injected into each key well.

### No Results Yet

UP to the present time, he said, increase in production has been negligible, but they do not expect any important increase for probably two or three months more. The gas has shown a tendency to by-pass into one well instead of affecting all four wells surrounding the key well. The operators hope that the operation will be successful in other ways than in increasing production, as it will provide a reservoir for the storage of gas as a stabilizing factor to restore lost pressure. Injection pressure was started at 430 pounds with volume of 830,000 cubic feet daily. The volume is now two million feet daily at pressure of 580 pounds, and it is planned to keep on injecting two million feet a day until results can be determined. Pressure necessary to maintain this volume is increasing slowly and is noted to have gone up about 40 pounds in the last 30 days.

Discussion of this talk was led by Dr. J. B. Umpleby and R. Van A. Mills. The latter told of some early experiments along the lines of restoration of pressure made by I. L. Dunn in 1913.

Dr. W. T. Thom, jr., of the U. S. Geographical Survey, spoke next on the possibility of soda ash drive in Salt Creek and in the Mid-Continent type of field. Discussion was participated in by R. Van A. Mills, of the U. S. Bureau of Mines, Dr. W. Van der Gracht, Marland Oil Co., Dr. J. B. Umpleby, Goldelline Oil Corp., and R. N. Peake, of the Mid-West Refining Co., Casper.

At the afternoon session, Alf. G. Heggem, president of the Oil Well Improvements Co., and general chairman in charge of arrangements for the meeting, presided. Mr. Heggem has long been identified with engineering progress in oil production, and was the first to bear the title of "Petroleum Engineer" when that rank was created by the Bureau of Mines. It was through his efforts that the Petroleum Division meeting was held in conjunction with the annual meeting of the Mid-Continent Oil & Gas association. This helped to bring to the meetings many men who otherwise probably would not have come. Engineers generally expressed the opinion that joint meetings of the two organizations should be made an annual affair.

Ben E. Lindsly, of the Bartlesville station, U. S. Bureau of Mines, who has been making a study of vacuum for several years, next read a paper on that subject, giving results of some of his observations. In general, he brought out that vacuum, while usually causing an increase in production, at the same time brought about reduction in the gravity of the crude, and that this reduction ordinarily would more than offset the gain in richness of casing-head gas. Restoration of pressure through injection of air or gas, he said, caused a much greater increase in production, and in the light of modern knowledge, is more desirable.

C. E. Beecher, of the Empire companies, discussed Mr. Lindsly's paper, and expressed the opinion that pressure restoration is much more desirable and efficient than vacuum. He left the impression that he considered the latter an obsolete practise. Fred F. Wood, of the Mid-West Refining Co., Casper, told of the use of vacuum in Salt Creek, and stated that it cut the gravity of the crude materially.

John E. Roth, of the Tidal Oil Co., reminded the engineers that a few years ago the installation of vacuum was in the nature of a fad in the Mid-Continent field and everybody was doing it. In many cases, it was the wrong thing to do. He urged that the same thing might happen in the case of pressure restoration, and made a plea for careful study of all conditions involved before artificial pressure is applied.

### Practice Once Justified

HOLLIS P. PORTER, of the Gypsy Oil Co., came to the defence of those who had applied vacuum in previous years, and went back into history for the benefit, as he said, "of the younger en-

(Continued on page 46)

Additional papers delivered before the Tulsa A. I. M. E. meeting, aside from those carried in the Oct. 13th issue of National Petroleum News, are to be found in this issue, Pages 65-77 and 102-104.

# Oklahoma-Kansas Producers Hold Annual Banquet In Tulsa

TULSA, Oct. 18

MORE than 350 producers attended the ninth annual banquet of The Oklahoma-Kansas division of the Mid-Continent Oil & Gas Association held at The Mayo Hotel on Oct. 12. The banquet was a closing feature of the two-day convention of The American Institute of Mining and Metallurgical Engineers and followed the annual business meeting of the producers at which the executive committee for next year was selected.

James A. Veasey, general counsel of the Carter Oil Co. was to have been toastmaster at the banquet and to have discussed legal aspects of the report of the Federal Oil Conservation Board. Unfortunately, Mr. Veasey was suddenly taken ill early in the day. His place as toastmaster was taken by W. C. Franklin, vice president of the Tidal Oil Co., and president of the Oklahoma-Kansas division of the association.

Judson C. Welliver, director of Public Relations of the American Petroleum Institute, spoke to the producers on "The Broader Concern of the Public Regarding the Petroleum Industry." Mr. Welliver rejoiced that the Federal Oil Conservation Board appears inclined to permit the oil industry to lead in the conservation of the oil resources of the country. He expressed the opinion that the industry is the best agency to look out for its own future.

In the course of his address the speaker recited how the nation has been alarmed about shortages of other commodities from time to time but that none of the predicted shortages has hampered development of the country, substitutes were developed or a greater supply of the commodity provided.

Glenn Griswold, editor of The Chicago Journal of Commerce, announced no subject either before or after speaking but humorously asked his auditors to vote what it was all about when he was through.

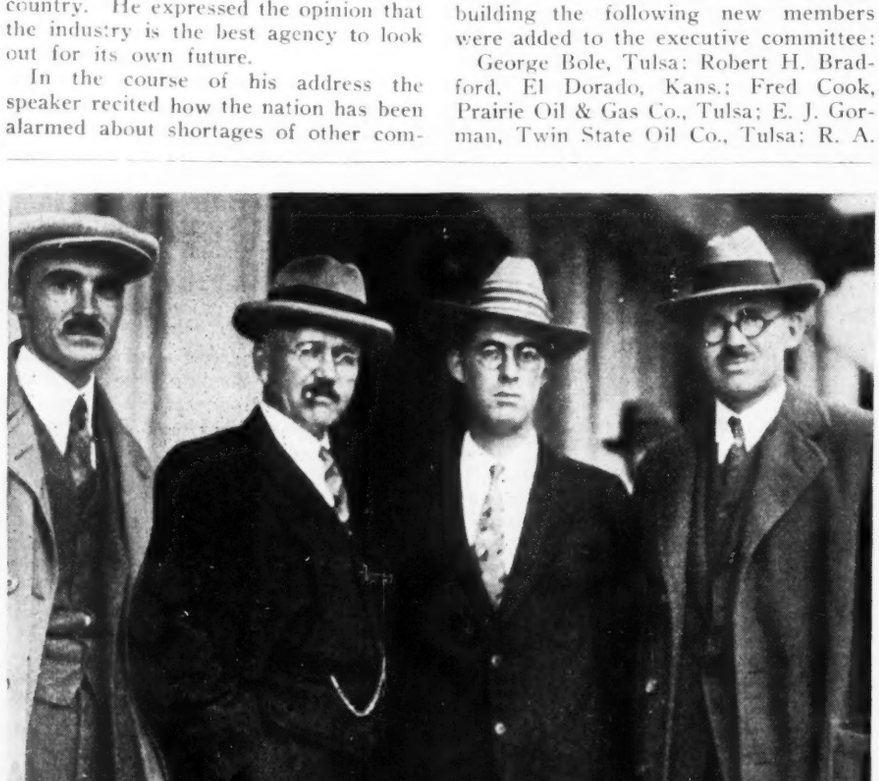
Stabilization of the petroleum industry is becoming an accomplished fact according to the belief of Mr. Griswold. He urged, however, that those in the industry consider it more as a business than as a "game" as has been the custom in the past.

A number of examples were given the producers of the way in which other industries have improved their relations with the public in recent years. Mr. Griswold referred particularly to public utilities and the railroads. He pointed out that the public now is more favorably inclined toward business than at any time in recent years. He urged the industry to push its public relations program while the time is auspicious since he thinks there will be a swing in the other direction.

At the annual meeting of the association at its headquarters in the Cosden building the following new members were added to the executive committee:

George Bole, Tulsa; Robert H. Bradford, El Dorado, Kans.; Fred Cook, Prairie Oil & Gas Co., Tulsa; E. J. Gorman, Twin State Oil Co., Tulsa; R. A. Josey, Josey Oil Co., Tulsa; Charles Page, Sand Springs; R. W. Ramsey, Oklahoma City; T. B. Slick, T. B. Slick Oil Co., Oklahoma City; and Harry C. Tyrell, Tulsa.

Members of the committee reelected include W. C. Abrams, Noble Oil & Gas Co.; G. D. Almen, Winona Oil Co.; J. W. Bates, Reiter-Foster Oil Co.; Guy Berry, Big Brother Oil Co., Independence; Burdette Blue, Indian Territory Illuminating Oil Co., Bartlesville; J. H. Boyle, Chestnut & Smith Corp., Frank Buttram, Buttram Petroleum Co., Oklahoma City; Louis Campbell, Magnolia Petroleum Co., Oklahoma City; H. H. Champlin, Champlin Refining Co., Enid; J. K. Cleary, Marland Oil Co., Ponca City; H. N. Cole, Pure Oil Co.; Burt H. Collins, Echo Oil Co.; James K. Crawford, Brothers Oil Co.; William N. Davis, Bartlesville; J. C. Denton, Mid-Continent Petroleum Corp.; A. L. Derby, Derby Oil Co., Wichita; Murray Doan, George A. Dye, H. F. Wilcox Oil & Gas Co.; T. T. Eason, Healdton Oil & Gas Co., Enid; W. W. Fleming, Mid-Kansas Oil & Gas Co.; W. C. Franklin, Tidal Oil Co.; Wirt Franklin, Ardmore; C. L. Freeland, Roland Oil Co., Bristow; John L. Gray, Shaffer Oil & Refining Co.; John S. Griffin, Sr., Griffin Producing Co.; R. A. Griffith, Sinclair Oil & Gas Co.; H. B. Gutelius, Continental Supply Co.; C. C. Harmon, Nowata; J. H. Hill, The Texas Co., F. B. Howland, Kewanee Oil & Gas Co., Titusville, Pa.; J. A. Hull, Hull Oil Co.; P. J. Hurley, Gilliland Oil Co., W. L. Jeffords, Chelsea; John H. Kane, Phillips Petroleum Co., Bartlesville; Dana H. Kelsey, Prairie Oil & Gas Co., Independence; W. L. Kistler, A. M. Landon, Independence; E. B. Lawson, Nowata; J. M. Lovejoy, Amerada Petroleum Corp.; Pat Malloy, Consultant Refining Co.; J. H. Markham, Jr.; D. B. Mason; Henry McGraw, Gypsy Oil Co.; J. J. McGraw, Exchange National Bank; C. L. McMahon, Okmulgee; D. F. McMahon, South Western Petroleum Co., P. M. Miskell, Empire Refineries, Inc., E. M. Moore, Independent Oil & Gas Co.; F. B. Parriott, Trans-Continental Oil Co.; C. B. Peters, Peters Petroleum Co., Waite Phillips; F. A. Pielsticker, Skelly Oil Co.; S. S. Price, Dixie Oil Co., Charles F. Noble, Clyde Papt, Selby Oil & Gas Co., E. B. Reeser, Barnsdall Oil Co.; G. S. Rollin, Roxana Petroleum Corp., Lee Scott, White Eagle Oil & Refining Co., Wichita; R. C. Sharp, Oklahoma Natural Gas Co.; J. J. Shea, Shea & Shea; W. G. Skelly, Skelly Oil Co.; J. W. Sloan, International Supply Co.; Harry H. Smith, R. H. Smith, Philadelphia; George Snedden, Lorraine Petroleum Co.; H. R. Straight, Empire Companies, Bartlesville; C. W. Titus; James A. Veasey, Carter Oil Co.; J. A. Vickers, Vickers Petroleum Co., Wichita; P. G. Walker, Jr.; L. H. Wentz, Wentz Oil Corp, Ponca City; Max Westheimer, Westheimer & Daube, Ardmore; W. E. Wood, Kingwood Oil Co., Okmulgee, and C. J. Wrightsman, Wrightsman Oil Co.,



*A group of engineers at the Tulsa meeting of the A.I.M.E. Left to right: Paul Reudemann, manager, Thompson & Black, Tulsa; H. C. George, director, school of petroleum engineering University of Oklahoma, Norman; E. O. Bennett, chief production engineer, Marland Oil Co. of Texas, Fort Worth; R. E. Davis, consulting engineer, Pittsburgh, Pa. Prof. George is proudly displaying his new mustache. The others are of older vintage.*

# Big Wells Push Steadily Mounting Production of Seminole Pool

Staff Special

TULSA, Oct. 18.

THE past week has been marked by a number of large completions in the Seminole field, resulting in a rapid increase in that field's output, and resulting, also, in a large gain in production for Oklahoma as a whole. In addition to the Seminole developments, the north Braman field, Kay county, contributed its quota of news by bringing in a 13,000-barrel well in the Wilcox sand, a well which came in too late in the week to have much effect on the state's daily average production but the influence of which undoubtedly will be marked in next week's figures.

Even without this big well, which is the state's biggest producer at the moment, and one of the biggest in the state's history, Oklahoma production increased 11,300 barrels in daily average during the week. It is now 486,050 barrels according to National Petroleum News' estimate, the highest figure of the year, and at the end of the week, the state was producing perilously near to 500,000 barrels a day.

Seminole wound up the week producing 58,124 barrels a day, with higher figures just ahead, and its daily average during the week was 47,140 barrels, a gain of 12,230 barrels over the preceding week. The 13 wells which are producing from the Wilcox sand made 48,149 barrels during the past 24 hour gauge, leaving 9075 barrels as the production from the 21 Hunton lime wells. Thus the per well average of the Wilcox sand wells is slightly over 3700 barrels, a remarkably high figure.

### Discovery Well Still Largest

THE Independent Oil and Gas Co.—R. F. Garland No. 1, Fixico which was the discovery well in the Wilcox sand continues to be the largest individual producer in the field, but has been dropping rather rapidly in the past two weeks, and is holding the lead by only a narrow margin. Its production during the past 24 hours was 6640 barrels, or only slightly more than the 6396 barrels of the No. 3 Bowlegs of the Indian Territory Illuminating Oil Co. which was one of the new wells brought in during the past week. This well which is located in the Swc Nw SE of 26-9-6 extended production a quarter mile south, being that distance removed from the Independent Garland No. 1 Fixico. It got the first oil at 4043 feet and has been drilled to 4050 feet, where it started off flowing 275 barrels an hour and averaged 266 5 barrels an hour for the first 24 hours. The I. T. I. O. Co. has a lease of 120 acres in the Southeast of Section 26 and is drilling 11 wells on it, in addition to the recent completion. Foster Petroleum Corp. owns a half interest in this lease, which comprises the N½ SE and SE SE of the section.

Detailed well completions in the Mid-Continent field for the week ending Oct. 16 are carried on Pages 78 and 79 of this issue.

Another Wilcox sand well completed during the week was the Independent-Garland No. 4 Fixico, in the NWC SW NE of 26-9-6, a location north of the discovery well. This well is two feet in the sand topped at 4131 feet and flowed 2987 barrels during the past 24 hours. The four wells on this lease produced 17,537 barrels during the same period. So far as is known, none of the wells has made any water. In fact, only two wells are known to be making water, and only a small amount in each case. These are the Gypsy Oil Co. No. 1 Carter, in the north end of the field, located in the SEc NE NW of 24 which is making 1468 barrels of oil daily, and the Amerada Petroleum Corp., Gardner Petroleum Co. No. 1 Killingsworth, in the SEc SW NE of 23, which made 2748 barrels of oil and 90 barrels of water in the past 24 hours. This well is being stimulated by injection of 900,000 cubic feet of gas daily, at pressure of 775 pounds.

### Field Variations

THE uncertain character of the field, insofar as it pertains to sand depths, is exemplified in the No. 2 Fixico of the Gypsy Oil Co. This well, located in the SEC NW NE of 26, had the Hunton lime 109 feet lower than it was found in its south offset, which is the Independent-Garland No. 3 Fixico. The Gypsy well is now at total depth of 4171 feet and is just in the top of the Wilcox at that depth. At last reports it had 3500 feet of oil in the hole with no gas and was drilling ahead. The same company's No. 2 Carter in the SWC NE NW of 24-9-6, the lease on which No. 1 is a producer in the Wilcox sand, topped the Hunton lime at 3950 feet and is drilling at 3988 feet, still in the lime, with a hole full of oil.

**When Rain Slants the Air**
(Oct. 27th Issue)

IT has a quicker effect on gasoline consumption than any other factor that refinery sales managers have to deal with.

Rainfall this year has been above normal at most points for most of the year, and the chief cause, refiners say, for the declining market of the past few weeks.

A special story showing the relation of gasoline shipments from Mid-Continent refineries to the average amount of rainfall in eleven central states—in the Oct. 27th issue.

### New Wilcox Area

ANOTHER important development of the past week was the discovery of the Wilcox sand in the Searight pool, about five miles northwest of the Seminole field. The well making this discovery was the **F. J. Searight No. 3** Youngblood, in the NWC NE SE of 33-10-6, formerly a producer in the Hunton lime, which up to this time has been the only producing horizon in the Searight pool. A few weeks ago it was reported that the Prairie Oil & Gas Co. had the Wilcox sand in one of its wells there, but this proved to be erroneous, as the well was in the Hunton. The Searight discovery well in the Wilcox topped that sand at 4310 feet and has been drilled in seven feet. The well produced 4383 barrels in the past 24 hours, and may make a lot more when drilled further into the sand. This will not be done until sufficient tankage has been provided, as it has been necessary to impound most of the well's output so far in earthen storage tanks.

Although it is possible, it does not appear likely that this well represents an extension of the Seminole field, but that it is rather the opener of another Wilcox sand pool similar to Seminole. The new well had been producing from the Hunton lime for some time, having made 500 barrels initial in that formation, as its production was declining steadily and it was making increasing amounts of water, it was decided to deepen it to the Wilcox for general results. This well's production is included in the figure given previously as the Wilcox production in the Seminole field.

The big well in the North Braman field, mentioned at the opening of this article, is the Comar Oil Co. No. 6-1 Harvell located in the SWC NW NE of 21-29-1, Kay county. This well got the Wilcox sand at 3350 feet, and had the big pay from 3356 to 3371, where at last reports it was flowing 570 barrels an hour by actual gauge. This rate of flow, if maintained, would produce 13,680 barrels in 24 hours, but the well's first full day's performance was not available as this was written. Prior to the completion of this well, the North Braman field was producing 14,760 barrels daily, so that the new well will come near doubling the field's output.

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ARCADIA, WIS.—M. J. Kamla sold out his oil marketing equipment this summer to Perfect Oil Co., La Crosse, Wis.

# Compilation Of Mid-Continent Refinery Operations

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National Petroleum News

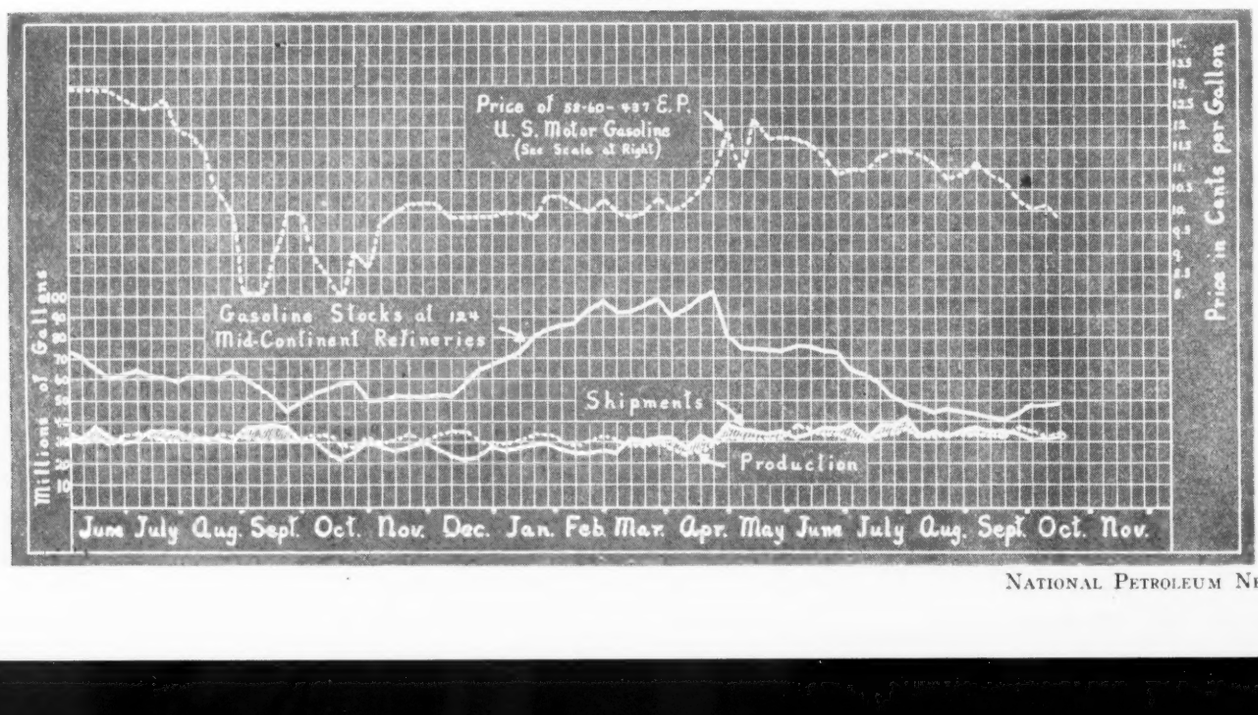
## Mid-Continent Refinery Operations Week Ended Oct. 15 (By Telegraph)

| | Kansas | Oklahoma | North and Cent. Texas | North La.-Ark. | Total Week Ended Oct 15 | Total Week Ended Sept.17 |
|---|---|---|---|---|---|---|
| Plants Reporting | 23 | 46 | 41 | 14 | 124 | 124 |
| Crude Cap. (Bbls.) | 98,200 | 165,900 | 144,300 | 53,700 | 462,100 | 462,100 |
| Cracking Cap. | 21,000 | 45,800 | 15,750 | 20,200 | 102,750 | ..... |
| Da. Av. Crude Runs | 59,415 +34.0 | 103,311 — 3.1 | 67,804 + 5.6 | 53,736 — 6.6 | 287,286 + 4.1 | 295,327 |
| Da. Av. Other Oils | 73.27 +121.9 | —2,372 ..... | 4,703 + 7.9 | 2,018 +27 7 | 11,726 +87.4 | 6,332 |
| **GASOLINE—Gallons** | | | | | | |
| Stocks Oct 8 | 10,604, 13 | 26,875,626 | 9,033,736 | 2,073,119 | 48,701,754 | 42,735,632 |
| Prod. 10-8 to 10-15 | 9,144,009 + 41.3 | 16,253,400 + 5.2 | 7,401,040 + 5.2 | 3,332,732 — 4.0 | 36,136,361 +11.4 | 35,733,580 |
| Ship. 10-8 to 10-15 | 8,613,222 + 31.0 | 15,673,155 +20.4 | 7,654,300 + 3.1 | 3,028,955 —24.1 | 34,969,632 +12 8 | 37,733,709 |
| Stocks Oct. 15 | 11,225,000 + 5.0 | 27,455,961 + 2.2 | 8,818,536 — 2.7 | 2,373,896 +14.7 | 49,873,483 + 2.4 | 40,705,503 |
| Ratio Sales to Prod. | 94.2% | 96.4% | 103.4% | 90.9% | 96.8% | 105.7% |
| **KEROSENE—Gallons** | | | | | | |
| Stocks Oct. 6 | 2,043,076 | 5,027,734 | 2,371,242 | 634,700 | 10,076,752 | 8,048,104 |
| Prod 10 8 to 10-15 | 1,640,503 + 52.3 | 1,999,354 — 8.3 | 1 424,811 + 2.3 | 398 543 —13.3 | 5,463,211 + 6.9 | 6,703,650 |
| Ship. 10-8 to 10-5 | 1,038,873 + 17 0 | 1,846,713 —13.4 | 1,358,942 — 2.7 | 478,373 +29.3 | 4,777,901 — 1.1 | 5,684,025 |
| Stocks Oct. 15 | 2,589,706 + 26.8 | 5,180,375 + 3.0 | 2,437,111 + 2.8 | 554,870 —12.6 | 10,762,062 + 6.8 | 9,037,729 |
| Ratio Sales to Prod. | 66.7% | 92.4% | 95.4% | 120.0% | 87.5% | 84.8% |
| **STOVE DISTILLATE—Gallons** | | | | | | |
| Stocks Oct 8 | 4,052,852 | 4,573,116 | 1,353,149 | 133,644 | 10,112,761 | 9,717,122 |
| Prod 10-8 to 10-15 | 915,425 + 55.3 | 984,360 — 3.6 | 223,626 —20.4 | 29,358 — 2.0 | 2,152,769 +12.0 | 1,733,781 |
| Ship. 10-8 to 10-15 | 503,116 —49.0 | 587,863 — 5.7 | 320,282 +82.3 | 19,362 —26.1 | 1,430,623 —21 0 | 1,557,761 |
| Stocks Oct. 15 | 4,465,161 + 10.2 | 4,969,613 + 8.7 | 1,258,493 — 7.1 | 143,640 + 7.5 | 10,834,907 + 7.1 | 9,923,145 |
| Ratio Sales to Prod. | 55.0% | 59.7% | 143.2% | 66.0% | 66.5% | 88.3% |
| **GAS OIL—Gallons** | | | | | | |
| Stocks Oct 8 | 8,888,259 | 31,786,323 | 11,155,586 | 3,928,984 | 55,759,152 | 53,654,611 |
| Prod. 10-8 to 10 15 | 1,477,714 + 46.7 | —359,292 ..... | 582,940 —26.4 | 3,054,799 —14.1 | 4,756,161 —27.5 | 6,613,181 |
| Ship. 10-8 to 10-15 | 1,576,835 + 11.8 | 504,831 —78.4 | 176,752 —81.5 | 3,023,793 — 3.1 | 5,282,211 —32.4 | 4,844,682 |
| Stocks Oct. 15 | 8,789,138 — 1.1 | 30,922,200 — 2.7 | 11,561,774 + 3.6 | 3,959,990 + 0.8 | 55,233,102 — 0.9 | 55,423,110 |
| Ratio Sales to Prod. | 106.7% | ..... | 30.3% | 99.0% | 111.1% | 73.3% |
| **FUEL OIL—Gal ons** | | | | | | |
| Stocks Oct. 8 | 11,551,511 | 69,779,291 | 16,610,307 | 11,146,151 | 109,087,260 | 103,556,812 |
| Prod. 10 8 to 10-15 | 5,635,254 + 32.7 | 8,747,616 — 0.7 | 8,268,770 +10.7 | 8,256,324 — 2.4 | 30,907,964 + 6.6 | 29,820,573 |
| Ship. 10-8 to 10-15 | 4,412,131 + 18.3 | 6,937,339 —18.0 | 9,177,938 — 0.4 | 8,776,382 +11.1 | 29,303,790 +0 01 | 32,138,398 |
| Stocks Oct. 15 | 12,774,634 + 10.6 | 71,589,568 + 2.6 | 15,701,139 — 5.5 | 10,626,093 — 4.7 | 110,691,434 + 1.5 | 104,238,992 |
| Ratio Sales to Prod. | 78.3% | 79.3% | 11.0% | 106.3% | 94.8% | 107.8% |

## Gasoline Produced by Various Methods, Week Ended Oct. 15

| | Kansas | % of Total | Oklahoma | % of Total | Texas | % of Total | Louisiana-Arkansas | % of Total | TOTAL | %of Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Straight Run | 6,284,590 | 68.7 | 11,0 6,945 | 68.3 | 6,036,357 | 81.5 | 1,034,030 | 31.9 | 24,481,952 | 67.8 |
| Cracked | 2,464,373 | 27.0 | 4,107,805 | 25.3 | 1,211,133 | 16.4 | 1,983,030 | 59.5 | 9,766,341 | 27.0 |
| Natural | 395,136 | 4.3 | 1,048,740 | 6.4 | 158,550 | 2.1 | 285,642 | 8.6 | 1,888,038 | 5.2 |
| Total | 9,144,009 | | 16,253,490 | | 7,403,040 | | 3,332,732 | | 36,136,361 | |

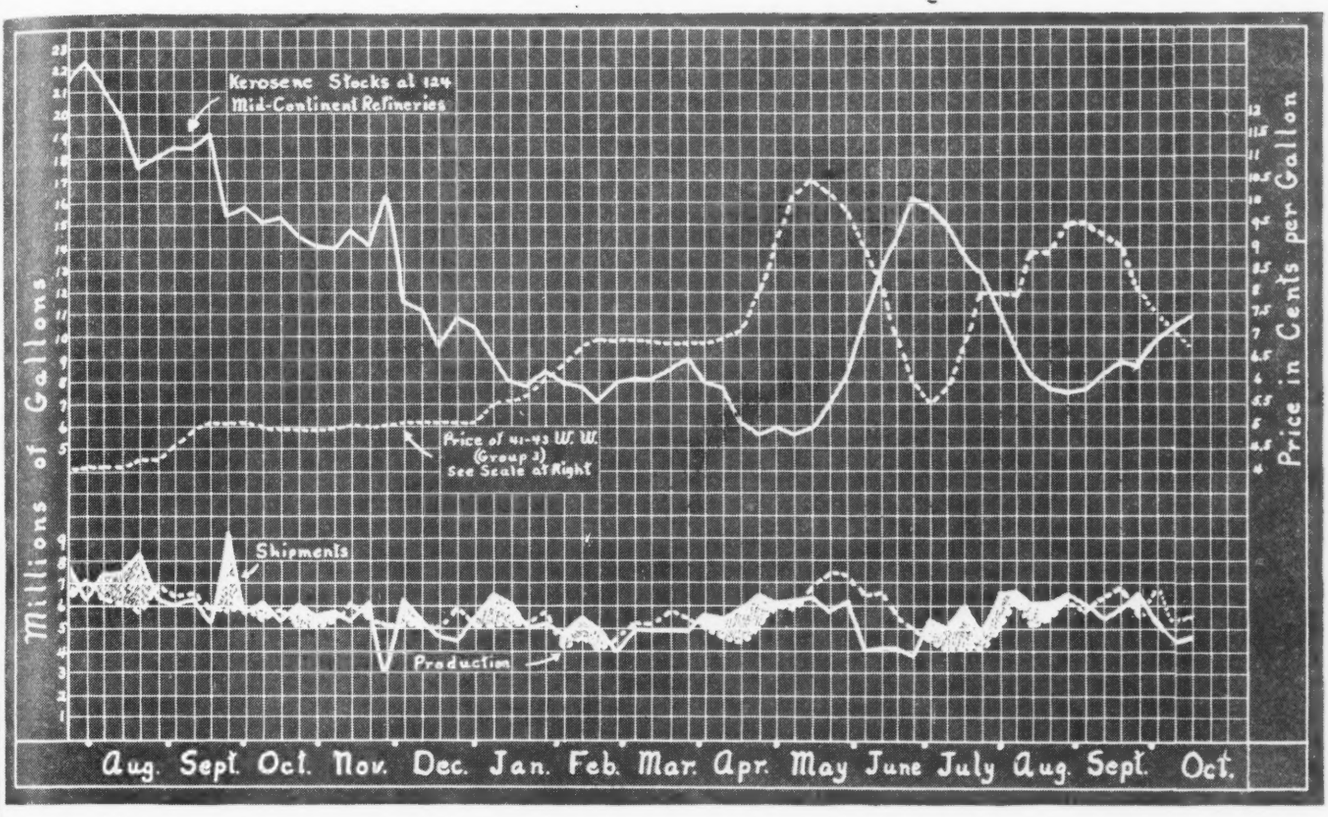
### GASOLINE


Price of 58-60- 487 E.P. U. S. Motor Gasoline (See Scale at Right)
Gasoline Stocks at 124 Mid-Continent Refineries
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
June July Aug. Sept. Oct. Nov. Dec. Jan. Feb Mar. Apr. May June July Aug. Sept. Oct. Nov.

## Barometer of Mid-Continent Refinery Market—Week Ending Oct. 15

*Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 124 Plants to National Petroleum News*

KEROSENE


Kerosene Stocks at 124 Mid-Continent Refineries
Price of 41-43 W. W. (Group 2) See Scale at Right
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct.

# Gasoline Stocks Rise Although Shipments Grow

Staff Special by Telegraph

TULSA, Oct. 19

SHIPMENTS of gasoline from 124 Mid-Continent refineries increased nearly 4,000,000 gallons in the week ended Oct. 15. The increase of 12.8 per cent brought shipments for the week up to 34,969,632 gallons, compared with 31,009,168 gallons in the week ended Oct. 8.

Production of gasoline was increased virtually as much as shipments, the total volume staying slightly above the level of shipments. Total production of the 124 plants for the week was 36,136,361 gallons compared with 32,430,504 gallons in the preceding week. Stocks were thus increased 1,100,000 gallons to 49,876,483 gallons, representing 10 days' supply at the current rate of shipment.

On Oct. 16, 1925, stocks at the same group of plants were 4,300,000 gallons larger with a total reserve at that time of 54,181,471 gallons. During the corresponding week last year gasoline production totaled 29,484,519 gallons, 7,000,000 gallons less than this year and shipments totaled 28,941,311 gallons, 6,000,000 gallons less than this year.

The increase in gasoline production last week as compared with the week ended Oct. 8 was caused largely by the fact that Kansas refiners are back on a normal schedule of operations after having been forced by floods to shut down. Crude runs to stills of Kansas refiners increased 15,000 barrels daily average over the preceding week to a daily average of 59,414 barrels. Charges of partly refined oils were increased 4000 barrels to an average of 7327 barrels a day in that state.

A small increase was recorded in crude charges at north Texas refineries which was offset by a reduction at Oklahoma plants. There was a reduction in runs at north Louisiana and Arkansas plants of 4000 barrels daily average with the result that for the entire group runs were increased 12,000 barrels daily average to an average of 287,286 barrels.

Production of kerosene was increased slightly in line with greater crude runs totaling 5,463,211 gallons and shipments were a little lower than in the preceding week, totaling 4,777,901 gallons. Stocks thus were increased 700,000 gallons to 10,762,062 gallons.

Stove distillate stocks increased about 700,000 gallons, reaching a total of 10,834,907 gallons. Shipments were far below production in Oklahoma, Kansas and north Louisiana.

North Texas and Louisiana-Arkansas refiners drew 1,400,000 gallons of fuel oil from storage to meet the demands of their customers but Oklahoma and Kansas refiners were unable to move their entire production and ran 3,000,000 gallons into storage. For the field as a whole stocks were increased 1,600,000 gallons.

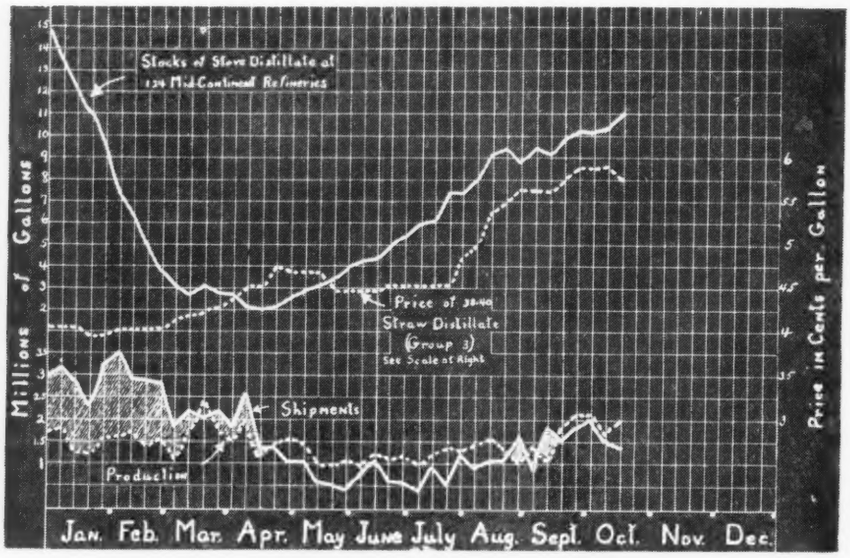
## Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Oct. 15. Change in stocks figured from Sept. 17.

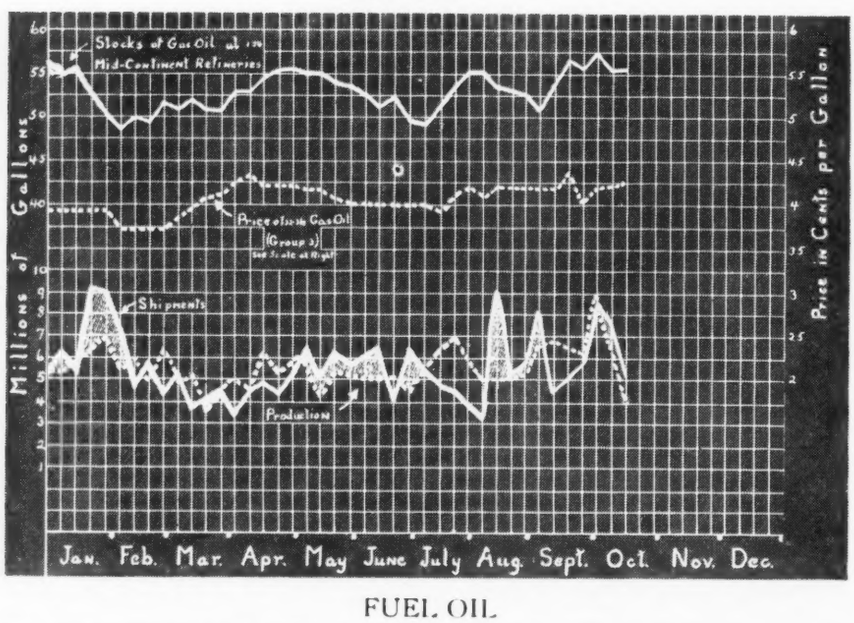
| | Gallons |
|---|---|
| **Gasoline** | |
| Production | 141,425,468 |
| Shipments | 132,254,488 |
| Net change in stocks | +9,170,980 |
| Ratio sales to production | 93.5% |
| **Kerosene** | |
| Production | 23,047,283 |
| Shipments | 21,352,950 |
| Net change in stocks | +1,694,333 |
| Ratio sales to production | 92.6% |
| **Stove Distillate** | |
| Production | 8,054,503 |
| Shipments | 7,142,741 |
| Net change in stocks | +911,762 |
| Ratio sales to production | 91.3% |
| **Gas Oil** | |
| Production | 27,247,452 |
| Shipments | 27,437,460 |
| Net change in stocks | —190,008 |
| Ratio sales to production | 100.7% |
| **Fuel Oil** | |
| Production | 120,353,101 |
| Shipments | 113,900,659 |
| Net change in stocks | +6,452,442 |
| Ratio sales to production | 94.6% |

**Barometer of Mid-Continent Refining Market—Week Ending Oct. 15.**

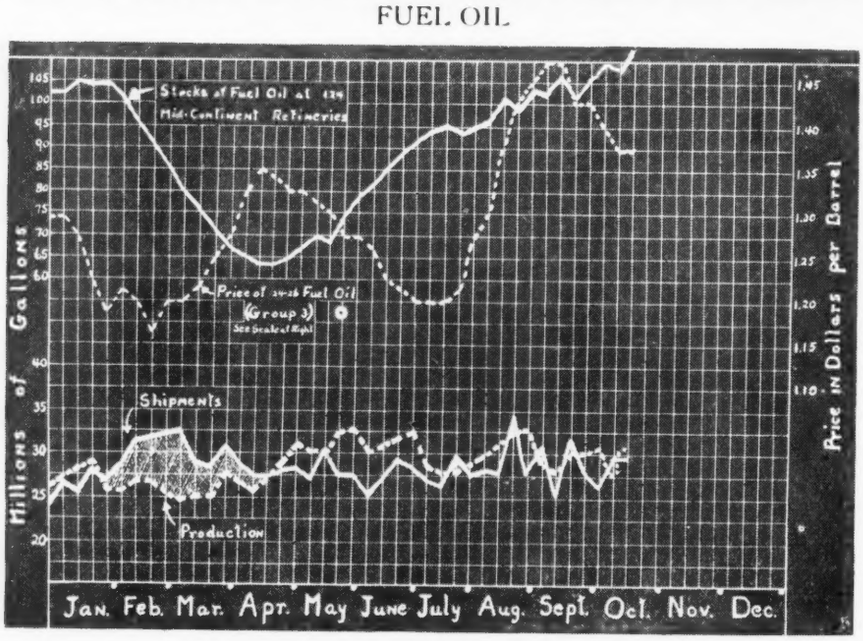
STOVE DISTILLATE


Stocks of Stove Distillate at 124 Mid-Continent Refineries
Price of 38-46 Straw Distillate (Group 3) See Scale at Right
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

GAS OIL


Stocks of Gas Oil at 124 Mid-Continent Refineries
Price of 32-36 Gas Oil (Group 3)
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

FUEL OIL


Stocks of Fuel Oil at 124 Mid-Continent Refineries
Price of 24-26 Fuel Oil (Group 3)
Shipments
Production
Millions of Gallons
Price in Dollars per Barrel
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

(Continued from Page 41)

gineers." He reminded them that when vacuum was being generally applied in the Mid-Continent, gravity made no difference, as crude was selling at a flat price. Increased production of crude and of natural gasoline were desirable and were the main considerations to be reckoned with. The use of vacuum to bring about these increases was therefore justified under existing conditions.

John R. Suman, of the Rio Bravo Oil Co., Houston, said that very little vacuum was used in the Gulf Coast and not much of it anywhere in Texas. He stated that the Railroad Commission requires hearings at which all concerned may present their sides of the matter before allowing the installation of vacuum. Operators are required to prove that properties are in an advanced stage of decline before permission to use vacuum is granted, and the application is often refused. L. L. Brundred, of the National Supply Co., Houston, also discussed the question, and joined in the opinion that pressure is more desirable than vacuum.

C. H. M. Roberts, of the William S. Barnickel Co., of St. Louis, then spoke on the problems involved in the use of Tret-O-Lite, a chemical used for the dehydration of crude oil.

At the conclusion of this paper, it was necessary to rush matters in order to finish on scheduled time, and discussion was limited to two minutes on all succeeding papers. The paper by H. F. Edwards, of the Humble Oil & Refining Co., was read by E. O. Bennett. Its subject was improved drilling and production methods in North-Central and East-Central Texas. H. B. Hill, of the U. S. Bureau of Mines, Dallas, read a paper on engineering study of the Powell field, Tex. John R. Suman then read the paper written by Joe H. Russell, of the Gulf Production Co., Houston. This paper was well illustrated with slides showing late types of equipment used in Gulf Coast fields. (This paper is published in this issue, page 102.)

Time being up at the conclusion of this paper, the meeting adjourned. Several papers were not called for on account of lack of time. Among these were those of J. R. McWilliams, Skelly Oil Co., on drilling and production methods in Oklahoma and Kansas, (published in this issue of N. P. N.), E. J. McKee, Phillips Petroleum Co., on drilling practice in the Panhandle, (published in N. P. N., Oct. 6), A. F. Hinton, National Petroleum News, on production problems in the Panhandle, and Max Bauer, Midwest Exploration Co., Amarillo, on the Panhandle field.

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CLEVELAND, O.—The Kentucky Oil Men's Association will hold a short business meeting December 11 when officers and directors for the coming year will be elected. Present officers are: A. R. Marshall, president; Thomas S. Scott, secretary; W. H. Courtney, treasurer; vice-presidents, J. H. Gardner, James W. Turner, L. C. Young, H. R. Levick, L. G. Cox, L. L. Roberts and W. S. Raydure.

# Don't let your money *drip* away!

One drop a second—408 barrels a year! That shows what a little leak may cost. That shows the price some users pay for poor fittings—and the *saving* assured you by the precise fit and finish of Wheaton Products. The head of one large oil company which standardizes on the Wheaton Type A Tank Truck Faucet recently said, "It would be a source of great satisfaction to me to definitely state the amount of saving this one specialty has been to my company." ¶ Every day, Wheaton faucets, valves, joints, couplings, fillers, nozzles and connections are preventing waste and saving money for the hundreds of Wheaton users. *Let them save money for you!* Don't let your money *drip* away! Send for a sample of any Wheaton Product. Test it for 30 or 60 days, and if it does not prove wholly satisfactory, you may return it for full credit or refund. Also, write today for illustrated catalog, containing complete information about all the Wheaton Products.

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*Type 60 Filling Pipe Cap*

*Single Swing Joint*

*Double Swing Joint*

*Tank Car Swivel Reducing Connection*

*Type A Tank Truck Faucet*

*Type B Tank Truck Faucet*

*Type 24 Tank Truck Faucet*

*Anti-Freeze Valve*

*Type 12 Gooseneck Open Hose Nozzle*

*Type 36 Quick Hose Coupling*

*Type 25 Loading Valve*

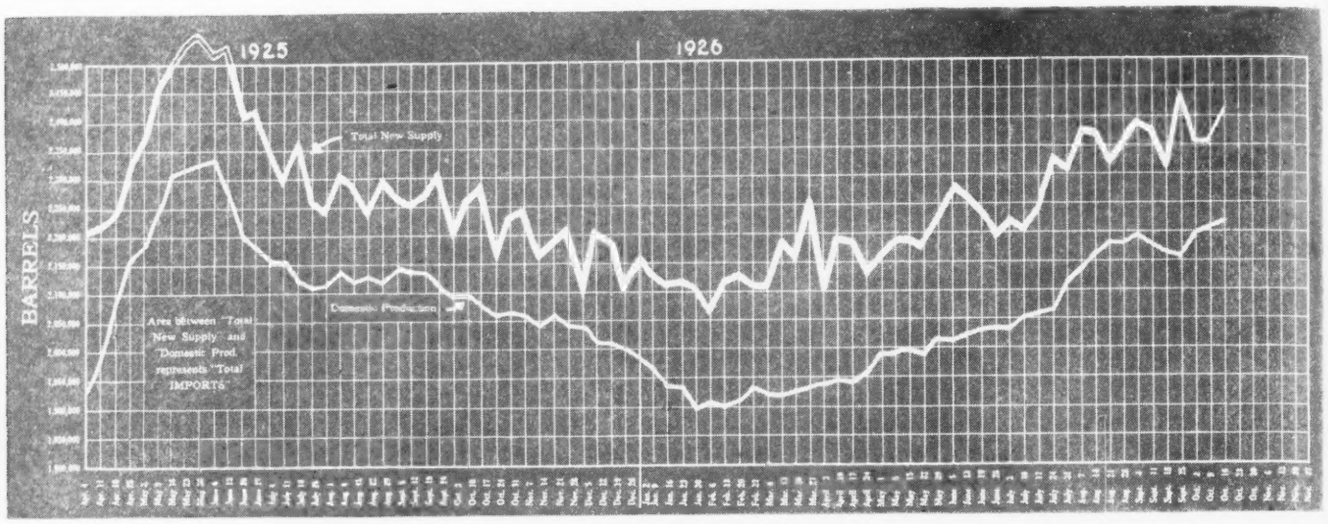
*Type 50 Wet Hose Auto-Filling Faucet*

*Type 26 Loading Valve*

A. W. WHEATON BRASS WORKS
NEWARK, N. J.

# Wheaton

# Daily Average Crude Oil Production and Imports




**Daily average gross crude output of United States, by fields, for week ending with dates given below, as compiled by American Petroleum Institute.**

## PRODUCTION SUMMARY

| | Oct. 16 | Oct. 9 |
|---|---|---|
| Production east of the Rockies | 1,625,850 | 1,601,700 |
| Increase | | 24,150 |
| Total Production in U. S. | 2,234,150 | 2,204,200 |
| Increase | | 29,950 |
| Crude Oil Imports | 168,143 | 147,429 |
| Increase | | 20,714 |
| Total Crude Supply | 2,402,293 | *2,351,629 |
| Increase | | 50564 |

*Revised

### OKLAHOMA

| | Oct. 16 | Oct. 9 |
|---|---|---|
| North Braman | 14,800 | 15,150 |
| South Braman | 6,750 | 6,800 |
| Blackwell | 3,900 | 4,150 |
| Hubbard | 2,650 | 2,800 |
| Thomas | 1,800 | 1,950 |
| Tonkawa | 36,350 | 36,900 |
| Garber | 25,000 | 26,100 |
| Burbank | 49,150 | 46,800 |
| Osage, outside Burbank | 34,400 | 34,500 |
| Wa'chorn | 4,150 | 4,150 |
| Cushing | 21,450 | 21,500 |
| Yale Jennings | 13,750 | 13,800 |
| Davenport | 5,400 | 5,250 |
| Bristow-Slick | 27,150 | 27,300 |
| North Okmulgee | 17,450 | 17,550 |
| Lyons-Deaner | 3,950 | 3,950 |
| Stroud | 2,000 | 2,000 |
| Cromwell | 15,100 | 15,300 |
| Papoose | 9,500 | 9,550 |
| Wewoka | 26,950 | 27,050 |
| Duncan district | 7,400 | 7,400 |
| Graham | 10,600 | 10,400 |
| Fox | 6,500 | 6,250 |
| Healdton | 14,950 | 14,700 |
| Hewitt | 11,150 | 11,200 |
| Seminole | 47,200 | 34,950 |
| Others | 66,700 | 67,500 |
| Total Oklahoma | 486,150 | 474,950 |
| Increase | | 11,200 |

### KANSAS

| | Oct. 16 | Oct. 9 |
|---|---|---|
| Greenwood County | 44,200 | 44,950 |
| Florence-Covert | 1,950 | 1,950 |
| Peabody-Elbing | 4,150 | 4,200 |
| Eldorado-Towanda | 13,750 | 13,750 |
| Augusta-Fox-Bush | 5,000 | 4,900 |
| Rainbow Bend | 3,400 | 3,500 |
| Russell | 4,500 | 4,500 |
| Others | 37,350 | 37,050 |
| Total Kansas | 114,300 | 114,800 |
| Decrease | | 500 |

### NORTH LOUISIANA

| | | |
|---|---|---|
| Homer | 5,550 | 5,600 |
| Haynesville | 9,150 | 9,200 |
| Caddo, light | 9,500 | 9,750 |
| Cad'o, heavy | 2,800 | 2,450 |
| De So'o, Red River | 4,050 | 4,000 |
| Elm Grove | 550 | 500 |
| Bellevue | 2,050 | 2,100 |
| Cotton Valley | 7,600 | 7,600 |
| Urania | 15,450 | 16,700 |
| Total North Louisiana | 57,000 | 57,900 |
| Decrease | | 900 |

### ARKANSAS

| | | |
|---|---|---|
| El Dorado | 6,950 | 6,850 |
| Smackover, light | 14,000 | 14,150 |
| Smackover, heavy | 117,850 | 117,850 |
| Stephens | 1,600 | 1,600 |
| Nevada | 1,850 | 1,900 |
| Lisbon | 7,650 | 7,800 |
| Total Arkansas | 149,900 | 150,150 |
| Decrease | | 250 |

### CALIFORNIA

| | Oct. 16 | Oct. 9 |
|---|---|---|
| Santa Fe Springs | 47,500 | 47,500 |
| Long Beach | 95,000 | 93,500 |
| Huntington Beach | 53,000 | 50,000 |
| Torrance | 27,000 | 27,000 |
| Dominguez | 21,000 | 21,000 |
| Rosecrans | 13,000 | 13,000 |
| Inglewood | 41,000 | 41,000 |
| Midway-Sunset | 94,000 | 94,000 |
| Ventura Avenue | 48,800 | 50,500 |
| Others | 168,000 | 165,000 |
| Total California | 608,300 | 602,500 |
| Increase | | 5,800 |

### EASTERN

| | | |
|---|---|---|
| (Including Ill., Ind., Ky., Ohio, W. Va., Pa., and N. Y.) | 109,000 | 109,500 |
| Decrease | | 500 |

### NORTH TEXAS

| | Oct. 16 | Oct. 9 |
|---|---|---|
| Purkburnett | 13,600 | 13,900 |
| Electra | 16,600 | 16,200 |
| Iowa Park and K-M-A | 4,050 | 4,000 |
| Wilbarger | 13,050 | 13,850 |
| Hutchinson County | 143,050 | 131,900 |
| Balance Panhandle | 11,600 | 10,350 |
| Petrolia | 700 | 650 |
| Archer County | 32,700 | 32,200 |
| Montague | 7,900 | 6,850 |
| Others | 800 | 800 |
| Total North Texas | 244,350 | 230,900 |
| Increase | | 14,150 |

### EAST CENTRAL TEXAS

| | | |
|---|---|---|
| Mexia | 11,200 | 11,200 |
| Currie | 750 | 750 |
| Richland | 1,350 | 1,350 |
| Corsicana-Powell | 24,300 | 24,950 |
| Wortham | 6,050 | 6,050 |
| Nigger Creek | 12,250 | 12,200 |
| Total East Central Texas | 55,900 | 55,800 |
| Increase | | 100 |

### WEST CENTRAL TEXAS

| | | |
|---|---|---|
| Stephens County | 10,700 | 10,800 |
| Eastland County | 5,500 | 5,500 |
| Desdemona | 1,700 | 1,700 |
| Young County | 6,950 | 6,850 |
| Brown County | 12,950 | 12,250 |
| Palo Pinto County | 400 | 400 |
| Callahan County | 4,150 | 4,200 |
| Shackleford County | 8,850 | 8,800 |
| Reagan County | 29,250 | 29,100 |
| Mitchell County | 3,650 | 3,800 |
| Crane and Upton Counties | 11,000 | 12,450 |
| Coleman County | 1,600 | 1,650 |
| Others | 2,450 | 2,800 |
| Total West Central Texas | 99,150 | 100,300 |
| Decrease | | 1,150 |

### SOUTHWEST TEXAS

| | Oct. 16 | Oct. 9 |
|---|---|---|
| Luling | 20,650 | 20,750 |
| Laredo District | 16,850 | 17,100 |
| Somerset | 1,950 | 1,950 |
| Lytton Springs | 3,650 | 3,650 |
| Piedras Pintas | 50 | 50 |
| Others | 500 | 550 |
| Total Southwest Texas | 43,650 | 44,050 |
| Decrease | | 400 |

### GULF COAST

| | | |
|---|---|---|
| Goose Creek | 7,500 | 9,950 |
| Hull | 22,650 | 21,450 |
| Saratoga | 1,450 | 1,150 |
| Blue Ridge | 1,950 | 1,600 |
| Damon Mound | 850 | 850 |
| Batson | 1,600 | 1,600 |
| West Columbia | 8,600 | 8,850 |
| Humble | 3,750 | 3,850 |
| Pierce Junction | 3,600 | 2,100 |
| Sour Lake | 7,550 | 8,700 |
| Spindleton | 78,000 | 79,800 |
| Orange County | 6,700 | 7,150 |
| Edgerly | 1,000 | 1,000 |
| Evangeline | 1,050 | 1,050 |
| Vinton | 6,000 | 6,000 |
| Lockport | 4,150 | 2,900 |
| South Liberty | 4,050 | 4,050 |
| Big Creek | 1,300 | 1,300 |
| Boling | 2,150 | 2,400 |
| Others | 1,650 | 1,700 |
| Total Gulf Coast | 166,750 | 167,450 |
| Decrease | | 700 |

### ROCKY MOUNTAIN

### WYOMING

| | Oct. 16 | Oct. 9 |
|---|---|---|
| Salt Creek | 45,900 | 43,150 |
| Grass Creek | 3,100 | 3,100 |
| Elk Basin | 800 | 800 |
| Big Muddy | 3,300 | 3,300 |
| Lost Soldier | 5,150 | 5,050 |
| Pock River | 2,750 | 2,600 |
| Hamilton Dome | (Shut in) | 1,200 |
| Teapot Dome | 1,050 | 250 |
| Lance Creek | 1,050 | 1,050 |
| Others | 2,150 | 2,350 |
| Total Wyoming | 65,250 | 62,850 |
| Increase | | 2,400 |

### MONTANA

| | | |
|---|---|---|
| Cat Creek | 2,600 | 2,650 |
| Sunburst | 18,000 | 18,000 |
| Others | 200 | 200 |
| Total Montana | 20,800 | 20,850 |
| Decrease | | 50 |

### COLORADO

| | | |
|---|---|---|
| Moffat (Craig) | 3,100 | 3,500 |
| Fort Collins | 3,550 | 3,350 |
| Florence | 450 | 500 |
| Others | 800 | 750 |
| Total Colorado | 7,900 | 8,100 |
| Decrease | | 200 |

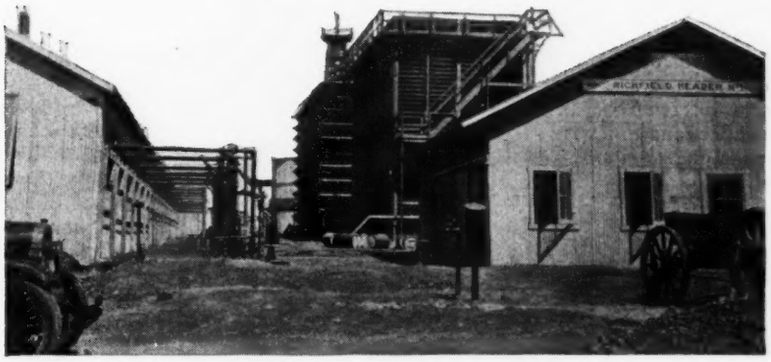
### NEW MEXICO

| | | |
|---|---|---|
| Artesia | 3,000 | 3,000 |
| Hogback | 750 | 750 |
| Table Mesa | 700 | ... |
| Rattlesnake | 1,300 | 1,050 |
| Total New Mexico | 5,750 | 4,800 |
| Increase | | 950 |
| Total Rocky Mountain | 99,700 | 96,600 |
| Increase | | 3,100 |

# Union Company Installs Central Plants To Apply Gas Lifts to Wells

By William E. Green

N. P. N. Staff Writer



*View of cooling tower at Richfield with compressor plant on the left and header building on right, with automatic pressure regulating valves between the two buildings.*

LOS ANGELES, CALIF., Oct. 16. THE Union Oil Co. of California in recent months has perfected the first successful system for the use of the gas lift method of producing oil wells on a large scale in one installation, doubling the production of the wells thus operated over the production with the ordinary pumping method in addition to increasing the flow of gas and greatly increasing the output of natural gasoline from these wells. Plants are in operation at six different fields of the company with results approximately the same.

The system that has been perfected by the Union Oil Co. has resulted in a most successful centralized control of a large number of wells, great economy in labor operations, centralization of power and greatly increased efficiency.

One of the outstanding results obtained by the Union officials at one well is the case of the Union Oil Co.'s Brooks 2 in the old Huntington Beach field. This well was pumping 110 barrels a day in May, 1925, and when placed on the gas lift June 1, 1925, the production was increased to 675 barrels a day from that date to May 31, 1926. From June 1, 1926, to date this well has averaged 1150 barrels daily through 6¼-inch oil string. The depth of this well is 4500 feet.

The Union has 93 wells operating with the gas lift. Three of the systems are operating in fields in what the Union terms the Los Angeles district, while the other three systems are in the Orange district, the accompanying table listing number of wells operated from each plant, with the daily production of each group of wells.

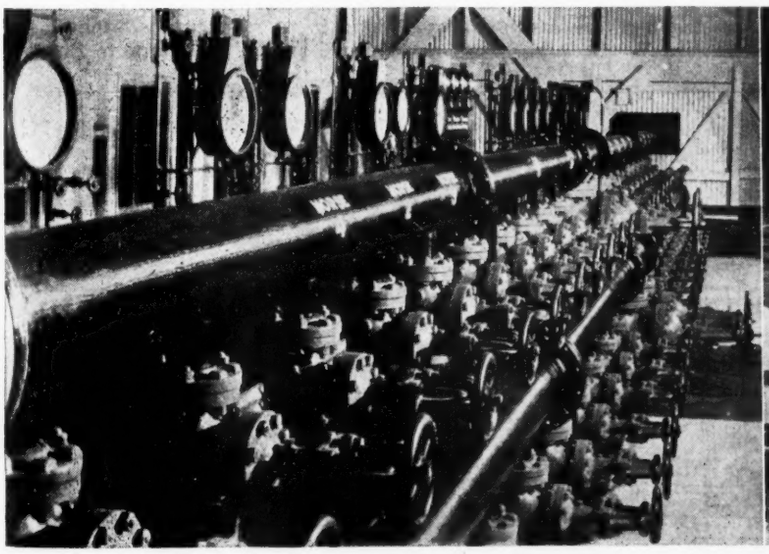
| Field | No. of Wells | Total Daily Prod. Bbls. |
|---|---|---|
| Orange district: | | |
| Richfield | 15 | 4,200 |
| Huntington Beach | 8 | 1,800 |
| Brea Canyon | 8 | 2,600 |
| Totals | 31 | 8,600 |
| Los Angeles Dist: | | |
| Santa Fe Springs | 22 | 8,000 |
| Dominguez | 15 | 9,000 |
| Rosecrans | 25 | 5,200 |
| Totals | 62 | 22,200 |
| Grand Totals | 93 | 30,800 |

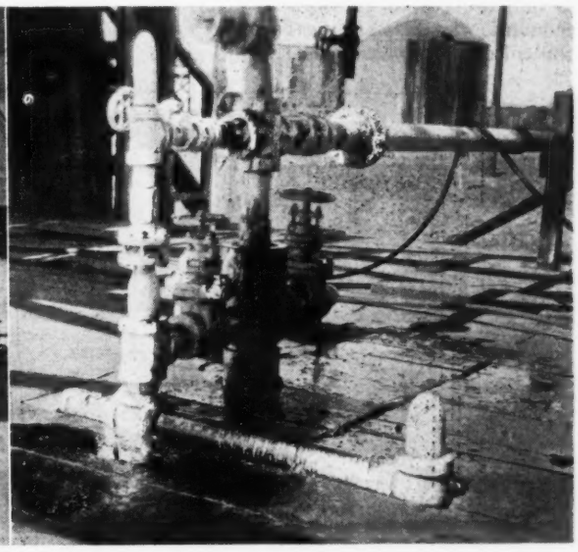
It will be noted that the daily well average in the Orange district is 277.4 barrels, while the daily average of the wells in the Los Angeles district is 358 barrels. The wells in the Los Angeles district are not nearly so old as the wells in the Orange District, thus explaining the difference in daily production.

According to the American Petroleum Institute figures for last August, the total of 367 producing wells in Huntington Beach produced at the average daily rate of 120.9 barrels, against 225 barrels daily for the wells operated by the Union on the gas lift. At Richfield, the total number of producers in August produced a daily average of 91.3 bls. against 280 bls. per well on the gas lift.

In the Los Angeles District, the total of 348 producers in August at Santa Fe Springs averaged 139 barrels against 363.6 barrels daily on the gas lift. In the Dominguez field, the total wells on production averaged 300.7 barrels to the well in August against 600 barrels a day per well on gas lift. At Rosecrans, the August average well production for the field was 105.4 barrels per day, against 208 barrels daily from the 25 wells on the gas lift.

The gas to oil ratio has been re-





*At the left is shown the distributing header room from where the gas is returned to the various wells. At right is a view of the tubing head connections at the well with trap and tanks in the background.*

duced in the gas lift wells in all fields where the gas lift is in operation from an average of 1850 cubic feet of gas per barrel of oil produced to 1200 cubic feet per barrel of oil, while in the Richfield district the reduction has been from 1500 cubic feet per barrel of oil to 1000 cubic feet of gas to a barrel of oil. This indicates a big step toward the conservation of the petroleum resources by effecting this economy in the gas production per barrel of oil.

It is the general opinion of petroleum engineers, geologists and oil producers that the ultimate recovery of oil from the oil sands is directly proportionate to the gas-oil ratio. For example, under certain production methods if the gas-oil ratio is 2000 cubic feet to the barrel of oil and an ultimate recovery of 1,000,000 barrels of oil is estimated, if the gas-oil ratio is reduced by one-half; that is, to 1000 cubic feet to a barrel of oil, the expected ultimate recovery is doubled, and in this example would be 2,000,000 barrels.

These splendid gas lift results have been accomplished under the direction of Frank F. Hill, manager of field operations for the Union Oil Co. In the Orange district, preliminary work was done while R. R. Templeton was serving as division superintendent, and upon his resignation, completed under the direction of F. W. Lake, who became superintendent of production in the Orange district after Mr. Templeton resigned, and who had handled the preliminary details from the start.

In the Los Angeles district, the gas lift systems were designed and installed under the direction of George Kammerer, division superintendent, and G. W. Black, petroleum engineer, at Santa Fe Springs, while installations were handled at Dominguez and Rosecrans by A. C. Rubel, petroleum engineer.

The Union started the gas lift experimental work early in 1925, dealing with the application of the gas lift to production of oil wells, including all phases from the successful application to individual wells through to the most economic and feasible means of for the control of the process. The whole work

*F. W. Lake, superintendent of production for the Union Oil Co. in the Orange district, standing by Foamite tank enclosure with hand resting on high pressure water hydrant.*

was in the experimental stage until the first part of 1926.

From the period of March 1 to July 31, 1926, compressor plants, headers, distributing systems and gathering systems were completely installed in the Richfield, Huntington Beach and Brea Canyon fields.

The Richfield plant was placed in operation the latter part of April, starting with 10 wells, with the other five being added very shortly thereafter. This installation was completed and in operation five weeks after construction work started.

The system as shown on the flow sheet accompanying this article forms a closed circuit of wet and dry gas, alternately compressed and expanded, as it does the work of lifting the oil to the surface.

The dry gas leaving the absorption plant is compressed in the high pressure compressor plant. The compressed gas is delivered to the distributing header where the volume and pressure required at each individual well is controlled. From the distributing header, individual lines run to each well in the system. In the normal procedure the high pressure gas is admitted to the well between the tubing and oil string. It is pumped down the well and enters the tubing at the bottom, lifting the oil to the surface.

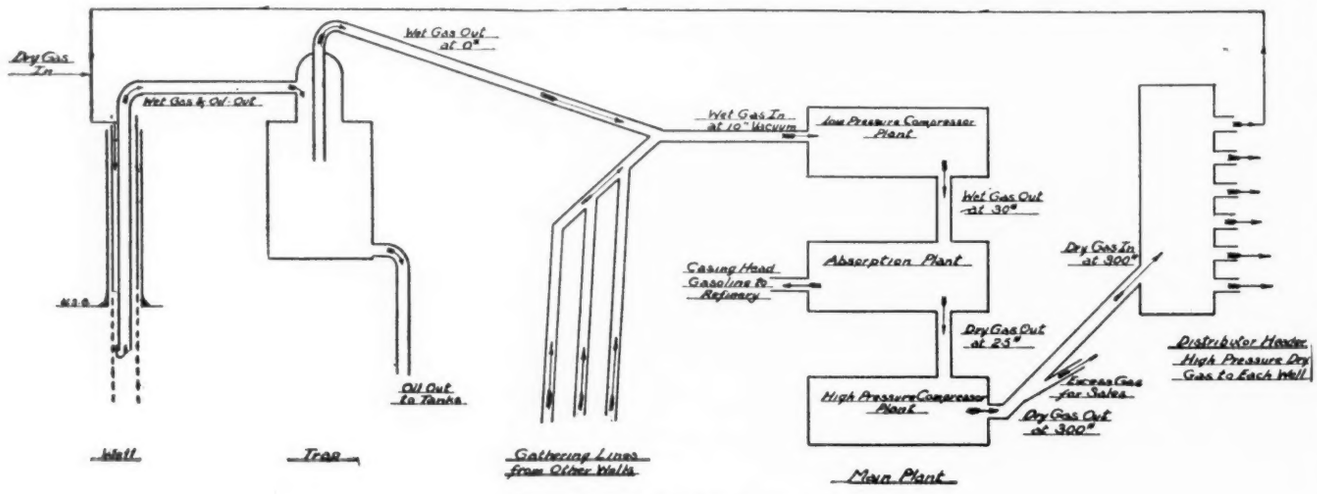
The oil and gas are then separated in a gas trap where the oil flows to the gauging tanks, while the wet gas enters the gathering system. The wet gas is pulled in from the wells through the low pressure compressor plant, which discharges the wet gas into the absorption plant. In the absorption plant the casinghead gasoline is extracted from the gas and the dry gas delivered to the intake of the high pressure compressor plant, thus completing the gas circuit.

The high pressure compressor plant in the Richfield district consists of nineteen 70 h.p. Broderick return tubular boilers using gas as fuel, connected through equalizing headers to 19 Chicago Pneumatic single cylinder direct connected compressors. Of the 19 compressors, 12 are 10″x10″x10″, used in compressing the gas from 25 pounds to 135 pounds. Five are 10″x7″x10″ and are used in compressing the gas from 130 pounds to 300 pounds, delivering the high pressure gas from the plant. There is one 10″ x 6″ x 10″ compressor used as a booster or starting compressor for kicking the wells over.

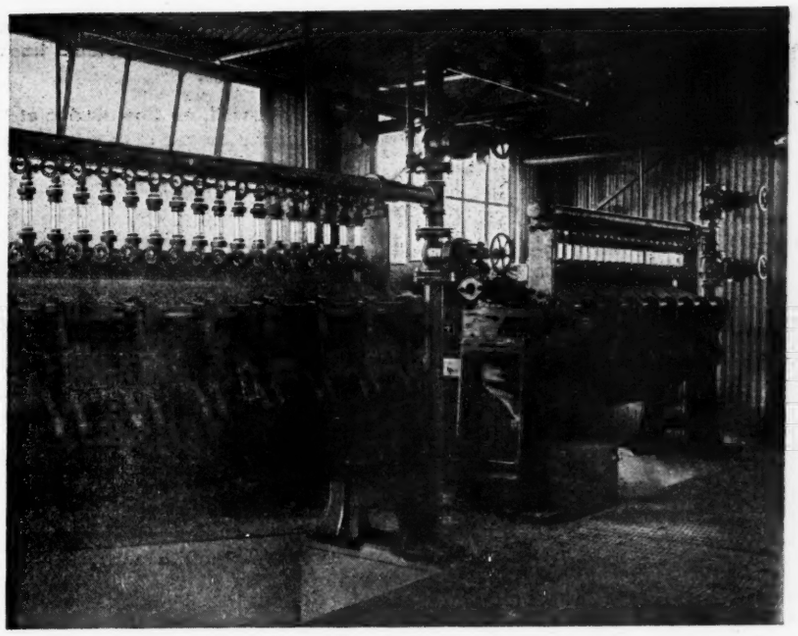
The distributing header consists of two main 8-inch lines with 3-inch individual lines to the wells. The distributing header is equipped with Westcott recording meters which show the actual volume and pressure of the gas delivered to each well at all times.

Some of the wells served are approximately one mile from the plant, although most of the wells are nearer. Distance of the well from the plant makes no difference in the operation.

The gathering system for bringing the wet gas from the well traps to the low


Dry Gas In
Wet Gas & Oil Out
Wet Gas Out at 0#
Wet Gas In at 10" Vacuum
Low Pressure Compressor Plant
Wet Gas Out at 30#
Absorption Plant
Casing Head Gasoline to Refinery
Dry Gas Out at 25#
High Pressure Compressor Plant
Excess Gas for Sales
Dry Gas Out at 300#
Dry Gas In at 300#
Distributor Header High Pressure Dry Gas to Each Well
Oil Out to Tanks
Well
Trap
Gathering Lines from Other Wells
Main Plant

*Flow sheet of Gas Lift System*



Contact Filtering of gasoline and kerosene.

Sweetland Filters in the refinery of the Western Oil and Refining Company. The left hand unit treats kerosene while the right hand unit filters gasoline.

Hoppers underneath discharge the cake directly into trucks.

# More Marketable Stocks Lower Costs To Produce Them

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EVERY practical step should be taken to improve the quality of stocks or to lower costs on existing high quality.

One way is to use the contact process.

Former difficulties in filtering off fine clays have been overcome by the use of properly designed pressure filters.

To-day, more than fifty refineries use the contact process with the aid of Sweetland Pressure Filters. The quality of oils and distillates is higher and the cost of producing this quality lower.

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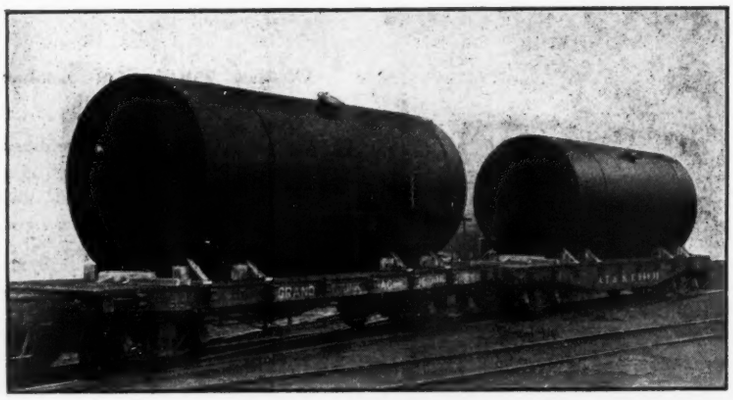
# STANDARD TANKS



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pressure compressor plant consists of 4-inch and 6-inch individual lines to the 16-inch mains.

At the well, no flow device at the bottom of the tubing is used. The size and depth of the tubing in conjunction with the amount of gas circulated are the controlling features in the success of the operation. Tubing sizes vary from 1¼-inch to 6¼-inch in the wells in the Orange district.

Gas volume circulated varies from 100,000 cubic feet to as high as 1,500,000 cubic feet per well per day. The total volume circulated from the Richfield plant approximates 8,000,000 cubic feet daily. The gasoline yield averages about 1¾ gallons to the thousand cubic feet of gas. The gas production from the wells runs close to 12,000,000 cubic feet daily, thus about 4,000,000 cubic feet daily is produced from the sand.

Before the gas lift was applied the 15 wells at Richfield averaged 175 barrels of oil daily, or a total daily production of 2625 barrels. After being placed on the gas lift, these wells averaged 350 barrels daily, or a total daily production of 5250 barrels, which in a six month period has dropped to 4200 barrels daily, the present production.

In the erection of the gas lift central plants, fire protection has not been lost sight of. At convenient points about the plant small individual Foamite tanks have been placed in enclosures, easy to reach in an emergency. By the side of each of the Foamite tanks, there is a high pressure water hydrant. The grounds surrounding the plant are kept as neat as a parlor—no waste of any kind being permitted to gather. A lady in her best dress could inspect the entire plant, inside and out, without any danger of soiling her attire.

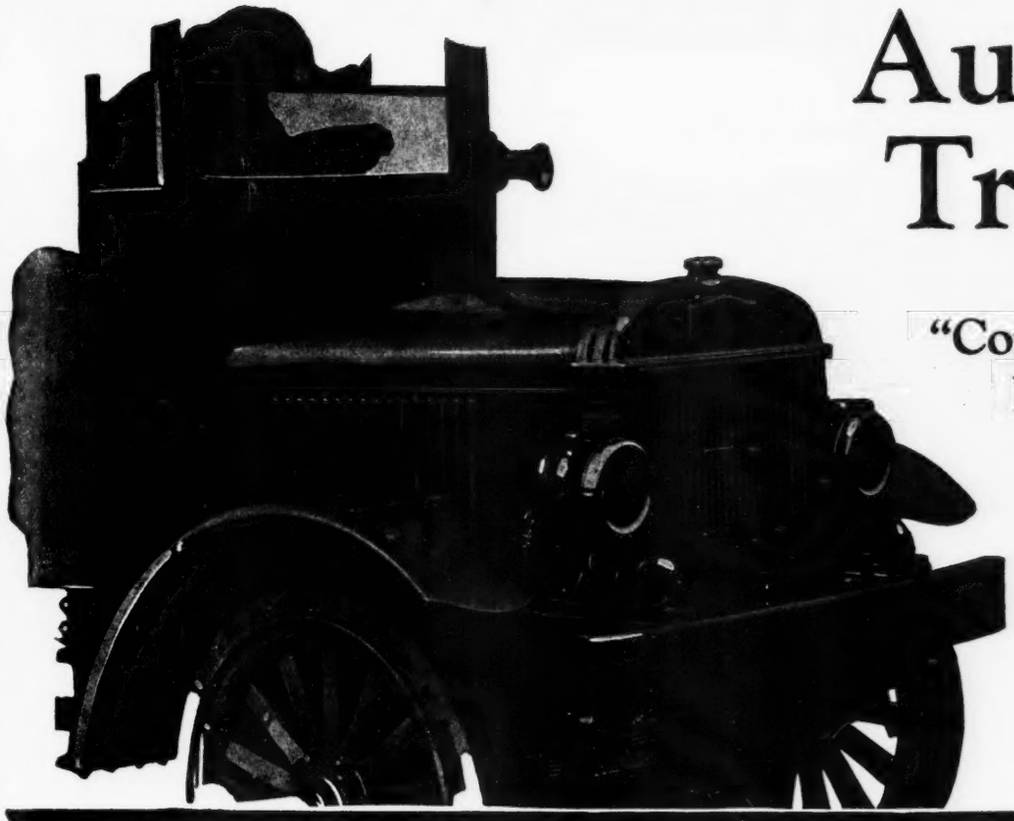
The officials of the Union Oil Co. are complimented highly by practically every visitor upon the completeness of the plants, their well kept condition, economy of operation, etc.

Mr. Hill and his associates probably have made interesting oil history in the past twelve months, and the president's conservation commission could spend two days very profitably to themselves at the Union's installations, studying the operations.

### San Antonio Jobbers Organize

SAN ANTONIO, TEX., Oct. 16.—The Independent oil jobbers of San Antonio recently formed an association for the purpose of becoming better acquainted with each other, according to R. E. Megee, owner of R. E. Megee & Co., here.

Officers of the association are: Raymond Russell, proprietor of the Russell Oil Co., president; O. F. Davenport, general manager of Laurel Petroleum Co., vice president; and Edwin Fisher, Oriental Oil Co., secretary and treasurer.



# Autocar Trucks

## *of* "Conventional Design"

We have started production on **Autocar** trucks of "conventional design"—with the engine under a hood out in front. These will be provided in capacities corresponding to our present line.

These additions to the Autocar line of motor trucks mean a further extension of the long-established Autocar policy of providing the correct wheelbase length for every hauling need. We have always believed that wheelbase length is an important factor in the economical operation of motor trucks. Increasing traffic congestion in all hauling centers makes short wheelbase handiness more important and a greater source of time-saving economy every year. We shall continue to build, recommend and sell short wheelbase, engine-under-the-seat trucks.

The Autocar truck, with the engine out in front, is changed in appearance only. It is the same Autocar truck whose economy and dependability have already been demonstrated in your service. It has the same 4-cylinder engine, the same transmission, the same rear axle, and will be sold at the same price schedule as our trucks with the engine under the seat. It is built in the same Factory and sold and serviced at the same Branches.

THE AUTOCAR COMPANY

*Extract from a letter that was sent to all Autocar users on August 20, 1926*

Ardmore, Penna.
Est. 1897

*President*

# Mid-Continent Refiners Ask Substantial Rate Reductions to Northeast

By J. C. Chatfield
N. P. N. Staff Writer

Tulsa, Oct. 19

UNFAVORABLE freight rates to northeastern states—where nearly half the nation's gasoline is consumed and only three percent produced—has held back the refining industry in the Mid-Continent field since 1919.

This, in a nutshell, was the testimony of W. S. Lynch, traffic expert for the Mid-Continent Refiners Traffic Association, at the Tulsa hearing of the Interstate Commerce Commission's investigation into petroleum rates east of the Mississippi river.

Presenting a voluminous exhibit prepared by himself and J. F. Lawrence, commerce counsel for the association, Mr. Lynch marshalled an imposing array of government statistics to show the lack of reasonable rates into the northeast throttled the Mid-Continent refiner and forced Mid-Continent crude into pipe lines to an ever increasing amount.

To correct this situation, Mid-Continent refiners are asking through, one-figure rates to territory east of the Indiana-Illinois state line and north of the Ohio and Potomac rivers. Their proposal suggests a reduction in rates to Indiana points ranging from 3 to 7 cents per hundred pounds, from 9½ to 16 cents in Michigan, from 3 to 14 cents per hundred in Ohio and even greater reductions to the states of West Virginia, Pennsylvania, New York, Maryland, Delaware, New Jersey, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire and Maine.

### Map Shows Proposal

FIG. 1 is a map showing the northeastern states to which the Mid-Continent refiners are seeking lower rates. The states are marked off into destination groups by heavy black lines and rates proposed by the refiners in cents per hundred pounds on gasoline and other light oils are shown in heavy black figures.

To the western edge of Indiana it is suggested that the present 33-cent rate from Group 3 to Peoria, Ill., be applied as an extension of the southern Illinois group. The second group is an extension of the Chicago 36 cent-group and includes Indianapolis, and Kokomo.

The third proposed group is an extension of the northern Illinois, and southern Wisconsin destination zone to which a rate of 38½ cents is proposed. This group would take in the southwestern corner of Michigan and the west one third of Ohio, extending almost to Columbus, Cleveland, Akron, Canton and Toledo in Ohio and Detroit and Muskegon in Michigan would be included in the 41-cent group as well as Charleston, W. Va.

The eastern edge of Ohio, the central portion of Michigan, the western one third of Pennsylvania, part of West Virginia, Maryland and the western edge of New York, including Buffalo, is suggested as a 43-cent rate group. The remainder of Pennsylvania and Maryland, all of Delaware, the western two thirds of New Jersey and the central part of New York is proposed as a 45-cent destination group. New England is largely in the proposed 47-cent group, the exception being Maine and the northern parts of Vermont and New Hampshire where a 49-cent rate is proposed.

### Enlarged Groups

IT will be observed that the Mid-Continent refiners have enlarged the destination groups as the haul is lengthened. Michigan is divided into four destination groups while Ohio has only three and Pennsylvania two. The rates have been stepped up more rapidly on the short hauls because of the lesser

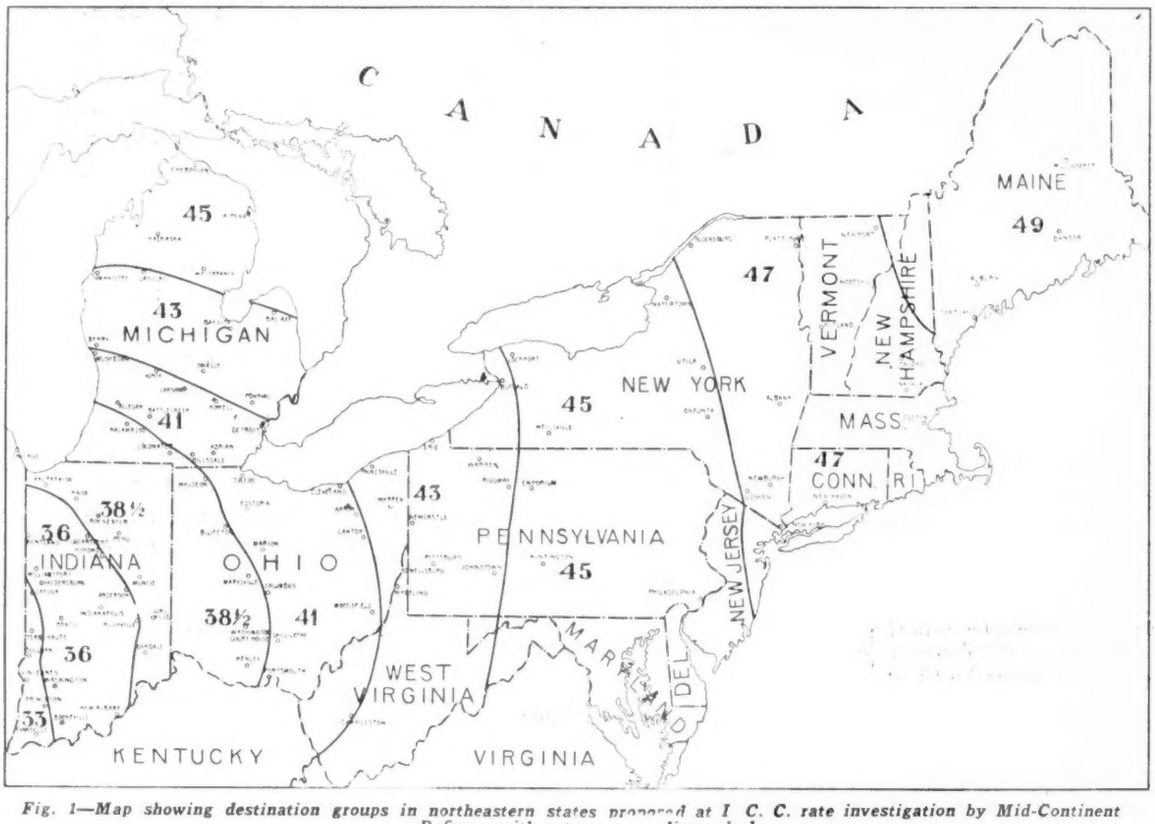



*Fig. 1—Map showing destination groups in northeastern states proposed at I. C. C. rate investigation by Mid-Continent Refiners with rates on gasoline asked.*

This is an open invitation to any "doubting Thomas" refiner to pay us a visit and study the results obtained by the Dubbs Cracking Process

Let him note carefully the character and cost of the charging stocks used, the cost of conversion and the percentage of gasoline obtained in a single operation

He will not only marvel at what he sees, but he will cease to doubt

Universal Oil Products Company
Owners of the Dubbs Process
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Chicago, Illinois

**Table No. 1—Showing Declining Percentage of Oil Carried by Railroad**

**Tons of Oil originated on Class 1 Railroads with tons of oil consumed in the United States exclusive of crude oil. (Exports not included.)**

| Year | Tons of Oil Originated on Railroads | Increase Over Previous Year | Percentage Of Increase | Tons of Oil Consumed In U. S. | Increase Over Previous Year | Percentage Of Increase | Percentage of Oil Consumed Carried by Railroads |
|---|---|---|---|---|---|---|---|
| 1919 | 24,465,116 | | | 38,581,863 | | | 63.40 |
| 1920 | 29,621,187 | 5,156,071 | 22.30 | 42,802,548 | 4,220,685 | 10.94 | 69.26 |
| 1921 | 27,203,510 | *2,417,677 | *8.19 | 44,116,135 | 1,313,587 | 3.07 | 61.66 |
| 1922 | 30,863,324 | 3,659,814 | 13.45 | 54,135,655 | 10,019,520 | 22.71 | 57.01 |
| 1923 | 36,401,305 | 5,537,981 | 14.70 | 65,662,698 | 11,527,034 | 21.29 | 55.44 |
| 1924 | 41,297,581 | 4,896,276 | 13.45 | 73,786,406 | 8,123,717 | 12.37 | 56.10 |

*Decrease.

density of traffic in Michigan and because of the rate making principle that ton mile earnings should be less as the length of the haul increases.

Producing and consuming areas of the United States were divided into six districts by Mr. Lynch in his testimony. On the west coast he included the states of Nevada, Arizona, California, Washington and Oregon, showing that this area produced 30.36 percent of the country's gasoline in 1925 and consumed 12.2 percent. The northwetsern group including the Rocky mountain states and North and South Dakota was shown to have produced 4.68 percent of the country's gasoline and consumed 4.2 percent, thus being self-sustaining with little surplus. The southeastern group included Kentucky and all states south of it including all of Arkansas and Louisiana and all of Texas except the refining group at Fort Worth, Dallas and in the vicinity of Wichita Falls. The southeastern group was shown to have produced 25.3 percent of the gasoline and consumed 18.6 percent, having a surplus of 6.7 percent.

The northeastern states shown in Fig. 1 were shown by Mr. Lynch to have produced only 3.07 percent of the nation's gasoline in 1925 and consumed 42.8 percent, or nearly half. Other producing areas had to move in 39.73 percent of the total gasoline production to supply the demands of this area.

It was said at the hearing that the only states to which the Interstate Commerce Commission has fixed rates are those in the central west, including Nebraska, Minnesota, Wisconsin, Iowa, Missouri, Illinois and the northern peninsula of Michigan. This area consumed 18 per cent of the nation's gasoline in 1925 and produced 1.03 per cent, having to import 16.97 per cent from the Mid-Continent and other areas. In the same year the Mid-Continent produced 35.6 per cent of the nation's gasoline and consumed 4.2 per cent being forced to ship to other areas 31.4 per cent. After supplying all of the deficit of the central western states the Mid-Continent still had 14.43 per cent of the country's gasoline to move into other areas.

### Refining At Standstill

SINCE 1919, crude production in the Mid-Continent has increased 51 per cent from 177,805,000 barrels to 269,731,000 barrels, while the capacity of operated refineries in the same area has increased only 0.8 per cent from 151,535,000 barrels of annual capacity in 1919 to 152,880,000 barrels annual capacity in 1925. During the same period crude production in the northeastern states has decreased 11 per cent from 26,023,000 barrels in 1919, to 23,251,000 barrels in 1925, while capacity of operated refineries has increased 95 per cent from 123,653,000 barrels annual capacity in 1919 to 240,749,000 barrels in 1925.

Consumption of gasoline has increased on a fairly regular basis from 1919 to 1925, 148 per cent in the Mid-Continent group, 124.1 per cent in the central west, 94.3 per cent in the sparsely settled northwest, 185 per cent on the west coast, 210.6 per cent in the southeast and 185.1 per cent in the northeast.

Mr. Lynch produced government figures to show that the percentage of crude refined in the Mid-Continent to the total crude produced in the field has been constantly declining. In 1919 the Mid-Continent refined 86 per cent of its own crude production and in 1925 only 57 per cent. All other groups have refined more than their own crude production. In the case of the northeastern states refiners it was shown that in 1919 they refined 476 per cent of their adjacent production and in 1925 this had increased to 1035 per cent of their production.

Because of the high level of freight rates to the northeast it was alleged by Mr. Lynch that refining capacity in that area had been enlarged greatly from year to year, leaving more and more idle capacity in the Mid-Continent. In 1925, 25.22 per cent of the refining capacity of the Mid-Continent was shut down while in the northeast only 2.02 per cent of the capacity was not being operated.

### Railroads Lost Tonnage

A STARTLING showing of the rate at which railroads have been losing oil traffic is shown in Table No. 1, which was presented to Examiner John B. Keeler, representing the Commission at the Tulsa hearing. The table gives the number of tons of petroleum products consumed in the United States from 1919 to 1925 and the number of tons of petroleum carried by Class 1 steam railroads. It will be observed that in 1920 the railroads carried 69.26 per cent of the oil and in 1924 only 56.1 percent.

Consumption of petroleum has increased at the rate of about 10,000,000 tons per year since 1921, while rail shipments have increased at the rate of about 4,000,000 tons per year. In 1921 rail tonnage decreased 2,417,677 tons, while consumption increased 1,313,567 tons.

In 1919 a little more than 14 million tons of oil were consumed without having been carried by the railroads and in 1925 this was more than doubled, running up to 32,500,000 tons. Some gain was made in 1920, but the 35 percent increase in reight rates halted the gains and caused an actual loss.

If the railroads had discouraged the building of pipelines and made rates which would move gasoline from the Mid-Continent to the northeast it was suggested by the witness they might have held their own and gained tonnage as rapidly as consumption increased during the past five years. Then the railroads would have originated 20,000,000 more tons in 1924 than they did and had a revenue $150,000,000 greater than they did.

Mr. Lynch pointed out that the entire loss that the railroads have sustained by holding up rates is not shown by the tonnage figures shown in Table No. 1. He stated that the railroads have lost much of the profitable long hauls by permitting oil to be carried long distances by pipe lines to refineries and then being permitted to carry finished products only short distances from refinery to consumer.

After presenting their reasons for the lack of growth of the refining industry in the Mid-Continent and their suggested remedy in the way of reduced through rates, the Mid-Continent Refiners representatives presented another mass of evidence seeking to justify the rates named on the basis of earnings which would accrue to the carriers per ton mile and on the basis of other rates now in effect for similar hauls.

The hearing here began on Oct. 15 and is expected to continue throughout the present week. The Transcontinental Oil Co. will put in its evidence seeking an adjustment of rates to the Southeast following the completion of evidence of the Mid-Continent Refiners Traffic Association.

### American Refining Co. Complaint

THE American Refining Co.'s complaint attacking rates to points in North and South Carolina and West Virginia was the first to be heard when the Tulsa hearing began on Oct. 15. In this case the American is seeking both lower rates in the future and reparations for high rates in the past. Business of the American Refining Co. in the Southeast has fallen rapidly during the past few years, according to J. B. Yeager, traffic manager and assistant sales manager of the company. He said that, in 1920, the company shipped 9 per cent of its output to the southeast. In 1921 this dropped to 5.7 per cent, in 1922 to 1.4 per cent and 1923 to 0.5 per cent. Since that time shipments have been less than one percent of the output of the Witchita Falls refinery.

(Continued on page 64)

# The truth about GASOLINE STORAGE TANKS

"You know, Jim, I've got a hunch that garages and service stations are getting pretty sick of these cheap, tissue-paper gasoline tanks. Everywhere I go, I see them laying around on top of the ground, all covered with mud. That means they've been yanked out.

"Looks as though the owner, after a year or two of service from these tanks, woke up to the fact that he had been putting 500 or 1,000 gallons of gas into his tank, and getting only about 450 or 900 out of it. And when he finally dug up the tank, ten to one, he found one or more pin holes had developed, and he'd been losing anywhere from a quart to ten gallons a day. A pin hole can cause a whale of a loss, too—if you don't happen to know it's there.

"Trouble is, Jim, builders of underground gasoline tanks get away with a lot—because they can bury their mistakes. Originally, gas tanks were made properly, 1/4 inch throughout. Then 3-16 inch—No. 10, No. 12, No. 14, and No. 16. And mind you, these tanks go into the ground, where they can't be watched, and where there's every chance for corrosion. No wonder pin holes and leaks show up after comparatively short service."

At Lancaster we build tanks that can be put into the ground and left there, without fear of pin holes or leaks showing up when least expected, to cause losses. Lancaster Tanks are built to last a lifetime. We *won't build a tank* lighter than 3-16 inch. And we make them of copper bearing steel. The cost of a copper bearing steel tank isn't a whole lot greater, either. As a matter of fact, on a 550-gallon size, the extra cost is only $1.50, and on the 1,000-gallon size, the cost is $2.25 extra. And the extra life given this tank by its copper bearing qualities can't be estimated in dollars and cents.

The security of knowing that a Lancaster Tank of copper bearing steel will stand up as long as you want it to—the feeling that the metal is heavy enough so there won't be any leaks developing underground—that the job is as sound throughout as Lancaster's guarantee can make it—these facts are well worth the extra cost. Because you have a steel tank of the finest quality, Lancaster-made, that won't let your profits slip away without your knowing it.

*Write to Lancaster for further facts and prices on 550- and 1,000-gallon Lancaster Tanks made of copper bearing steel. Let us put you on our mailing list for monthly prices on Lancaster's "Big Twelve" Standard Storage Tanks —carried in stock for immediate shipment up to 25,000 gallons capacity.*

LANCASTER IRON WORKS, INC.
574 South Prince St., Lancaster, Pa.

501 Fifth Ave., New York City — 10 High St., Boston, Mass. — Land Title Building, Philadelphia

# LANCASTER
## GASOLINE STORAGE TANKS

# Committee D-2 Will Help Eastern Refiners Solve Pour Test Problem

By Paul Truesdell
N. P. N. Staff Writer

CLEVELAND, Oct. 16

THE appearance of six representatives of the Pennsylvania and West Virginia refiners at the three-day meeting of Committee D-2 of the American Society for Testing Materials, which ended here today, was welcomed by committee members as an opportunity to be helpful to a section of the refining industry faced with a serious problem.

The refiners came to protest against the method for cloud and pour test of lubricating oils which has become standard as the official A. S. T. M. method. These refiners stated that the test method in use works a hardship on them in that it does not give an accurate indication of the quality of the oil with reference to pour point after it has stood in the containers for 24 or 48 hours.

The six representatives of the refiners were W. S. Zehrung, Pennzoil Co., Oil City, Pa.; Paul Green, Conewango Refining Co., Warren, Pa.; Fred G. Clark, Fred G. Clark Co., Cleveland; McLean Houston, United Refining Co., Warren, H. W. Walchli, Tiona Refining Co., Clarendon, Pa. and P. S. Tarbox, Independent Refining Co., Oil City.

The refiners' spokesmen stated that the A. S. T. M. pour test method is conscientiously carried out on the oils before they are filled into the shipping packages. It is found, however, that after standing for a day or two the condition of the oil changes. Sometimes it cannot be poured out of the can or barrel. Therefore, disputes arise between buyer and seller on this ground and sometimes difficulty is experienced in unloading shipments.

Generally the oil in the container is restored to somewhere near its original pour point by shaking up the container when this is possible, it was stated.

What the refiners want is a pour test method which will make it possible to predict that the cold test or pour test of an oil will be the same after it has been standing for awhile as when it comes from the refinery tanks. Committee D-2 is going to do more work on this and attempt to amend the specified method so it will meet this objection.

### Should Study Tentative Standards

THE fact that it was necessary for these refiners to appear and make their complaint to the committee long after the method had passed through the tentative stage and become the standard method of the association, was pointed to by the chemists forming the committee as emphasizing the importance of refiners and technologists in the refining and marketing branches of the industry keeping in close touch with the proceedings of Committee D-2 and scanning carefully the tests and test methods put out from time to time by the committee as tentative standards.

Every method worked out by the committee is put out first as a tentative standard and published. It remains as tentative for one year, for the express purpose of allowing those interested to study it carefully and make criticisms or comments. The committee, in fact, asks that these tentative standards be studied with a fine tooth comb so that when they are finally adopted as standards by the society, they shall be best adapted to meet the needs of all branches of the industry in all sections of the country.

It was stated today that very few criticisms of the tentative standards have ever been offered by anyone outside the committee membership. Thus, the eastern refiners let the objectionable method of making the pour test slip by them and become a tentative and then an official standard without making their protest.

It is said that a great deal of trouble could be avoided if those interested would scrutinize the tentative standards as they are published and bring their objections to the attention of the committee, so they could be ironed out before the methods reach the status of approved standard methods.

Committee D-2, in order to give the industry more insight into the work it is doing has appointed a committee on public relations. E. N. Hurlburt, Taylor Instrument Co., Rochester, N. Y. is chairman. The other members are Dr. R. P. Anderson, technologist of the American Petroleum Institute and secretary of Committee D-2, and F. A. Hull, General Electric Co., chairman of Committee D-2.

### Oil Technologists Invited

WHILE much of the work of the committee is confidential, it is felt that, by keeping the industry informed generally as to the line of work it is pursuing, it will be possible to establish closer contact with technologists of the industry who are not members of the committee.

The committee invites men in the industry who are interested in the work to sit in on its sessions and take part in the discussions, whether they are members or not, it being understood that the proceedings are to be held confidential.

Because of the wide variation in specifications of oils laid down by the manufacturers of various burners for use in their equipment, there has been considerable confusion in the definition of and specifications for oil for use in different burners.

Sometime ago, Leod D. Becker, secretary of the American Oil Burner Association, asked the secretary of the American Society for Testing Materials if that body would formulate an outline of specifications that would help in making possible uniformity in the grade, quality and nomenclature of the oils offered to the oil burner users.

A sub-committee of Committee D-2 was appointed with J. B. Rather of the Standard Oil Co. of New York as chairman and a skeleton outline of burner oil specifications is the result of the subcommittee's work. The outline was submitted by Mr. Rather to Committee D-2 at the meeting. The outline is not intended to be conclusive or binding on the oil burner industry but is to be offered for the burner manufacturers' consideration with the hope that it may be helpful in standardizing domestic heating oil.

As is the usual practice at the fall meetings of Committee D-2, most of the time was spent in planning for the work of the coming year.

Two new sub-committees were authorized, one on sampling and gauging and one on autogenous ignition of petroleum products. Dr. A. E. Flowers of the De Laval Co. was named chairman of the former, with authority to choose his own committee members. Dr. Flowers and A. J. Kramer, Bureau of Mines, a member of the Federal Specifications Board, agreed that Dr. Flowers will work informally with the government board toward the end of developing rules to govern sampling and gauging of tanks, ships and pipe lines that would be satisfactory to the government body and also to the oil industry.

A. H. Nuckols of the Underwriters Laboratories was named chairman of the committee for the study of autogenous ignition and he also will choose his own committee members.

It was decided that the next meeting of the society shall be held in Tulsa, Dec. 6, the day before the opening of the American Petroleum Institute annual meeting. The spring meeting, it was voted, will be held in Washington the first week in March.

Dr. T. G. Delbridge, Atlantic Refining Co., the representative of Committee D-2 on the advisory board of the technical committee of the Federal Specifications Board, reported that the technical committee has approved the ad-

visory board's request for the raising of the 90 per cent point for U. S. Motor gasoline from 392 F. to 396 F. but had rejected the board's other recommendations relative to revision of other points in the distillation range.

There was considerable discussion on this and it was decided to canvass the membership by letter ballot as to their opinions on this point, and that the results shown by the letter ballot be discussed further at the Dec. 6 meeting in Tulsa. A. J. Kramer of the Federal Specifications Board agreed that that board would postpone final action on this until after this meeting.

Another point that is to be taken up by letter ballot is the proposed change of the flash point of kerosene in the federal specifications to 115 F. This change, it is felt, will be hurtful to the California Refiners and it is expected they will be present to state their views at the Tulsa meeting.

### Subcommittees Report

THE first day's sessions, Thursday, Oct. 14, were taken up almost entirely with the reports of the various sub-committees. The committees reporting and their chairmen are as follows:

No. 20, Nomenclature, K. G. Mackenzie, The Texas Co., chairman; No. 23, Carbon Residue, F. R. Baxter, Vacuum Oil Co. chairman; No. 9 Precipitation, L. W. Parsons, Tide Water Oil Co., chairman (report made by M. C. Bloom representing Mr. Parsons); Sulfur Determination and Differentiation, E. Johansen, New England Oil Refining Co., chairman; Crank Case Dilution, T. S. Sligh Jr., Studebaker Corp., chairman; Cloud and Pour Points, R. R. Matthews, Roxana Petroleum Corp., chairman.

It was in connection with the report of the committee on cloud and pour point that the eastern refiners appeared to register their complaint.

The Friday forenoon session also was devoted to reports of sub-committees, the following reporting: No. 3, Paraffin Wax, J. B. Rather, chairman; No. 17, Gasoline, Dr. T. G. Delbridge, chairman; No. 10, Oxidation at High Temperatures, A. Ludlow Clayden, Sun Oil Co., chairman and No. 27, Application of Tests, C. A. Lunn, chairman (report made by Dr. R. P. Anderson, technologist American Petroleum Institute.)

At the Friday afternoon session, T. H. Rogers of the Standard Oil Co. of Indiana read a paper on "Oxidation and Demulsibility Tests for Turbine Oils" which was presented first before the Petroleum Division of the American Chemical Society in Philadelphia in September and which will be published in Industrial and Engineering Chemistry.

Dr. Delbridge read a paper on "Color Determination of Lubricating Oils by Means of Chemical Solutions", prepared by J. P. Carter and H. M. Hancock of the Atlantic Refining Co. H. T. Kennedy of the Bureau of Standards discussed work being done by the bureau along the line of determination of sulfur in burning oils by means of the Kennedy lamp. No conclusive results have yet been reached, the discussion brought out.

General discussion of the detonation characteristics of motor fuels was led by Dr. Delbridge.

Friday evening was the committee banquet, held in the Hotel Cleveland.

This morning the main meeting of the committee was held and the discussion of the Federal specifications, the appointment of new committees and the skeleton outline of specifications for domestic heating fuels discussed.

Those present at the meeting were: F. A. Hull, General Electric Co., chairman of Committee D-2; F. R. Baxter, Vacuum Oil Co.; H. T. Bennett, Mid-Continent Petroleum Co.; A. Ludlow Clayden, Sun Oil Co.; L. L. Davis, Pierce Petroleum Co.; E. W. Dean, Standard of New Jersey; G. A. De Graaf, Public Service Electric Co., Irvington, N. J.; T. G. Delbridge, Atlantic Refining Co.; J. G. Detwiler, The Texas Co.; Dr. H. C. Dickinson, Bureau of Standards; Dr. A. E. Flowers, De Laval Co.; H. Farmer, Philadelphia Electric Co.; Dr. G. W. Gray, The Texas Co.; J. B. Hill, Atlantic Refining Co.; E. N. Hurlburt, Taylor Instrument Cos.; E. M. Johansen, New England Oil Refining Co.; H. T. Kennedy, Bureau of Standards; A. J. Kramer, Bureau of Mines; H. C. Loudenbeck, Westinghouse Electric Co.; K. G. Mackenzie, The Texas Co.; R. R. Matthews, Roxana Petroleum Corp.; C. P. McNeil, Standard of Indiana; L. M. Hendrickson, Marland Refining Co.; C. R. Wagner, Pure Oil Co.; M. C. Bloom, Tide Water Oil Co.; J. B. Rather, Standard of New York; C. J. Rodman, Buckeye Jack Mfg. Co.; S. Tijmstra, Roxana Petroleum Corp.; C. W. Willharm, Westinghouse Electric Co.; R. N. Wilhelm, C. J. Tagliabue Co.; T. S. Sligh Jr., Studebaker Corp.; N. F. LaJeune, Atlantic Refining Co.; V. N. Jenkins, The Texas Co.

## Middle Atlantic States To Form Association

PHILADELHIA, Oct. 13.—An association of Independent oil men in the middle Atlantic states will be organized in Atlantic City during the annual convention of the National Petroleum Marketers Association on Steel Pier, Oct. 26, 27 and 28. A special call has been issued to Independent oil men in every branch of the industry in Pennsylvania, New Jersey, Maryland, Delaware and the District of Columbia by J. Shlifer and S. W. Rusk of the Intercity Oil Co. of Philadelphia.

A circular letter urges all oil men in these states to be present at the N. P. M. A. meeting and emphasizes that many years may elapse before another such gathering will be held in the east. "The Independents in the east must not miss this opportunity to get the benefit of the experience of the westerners," the letter says. "It is planned to start the new eastern organization with a paid traveling secretary.

The time and place for this special session of the oil men of the middle Atlantic states has not been determined, but it will be planned so as to have all the officers and especially secretaries of present state associations in attendance if possible.

## Oil Companies Warned Against Fake Testing Apparatus

CLEVELAND, Oct. 16.—To warn refiners and marketers against being mislead into the purchase of inferior laboratory testing equipment, the general advisory committee of the American Society for Testing Materials meeting in Philadelphia last week, authorized the publication of the following resolutions adopted by Committee D-2 of the society at its meeting last June.

"It has come to the attention of the society that apparatus for use in testing petroleum products which is not in conformity with the specifications of A. S. T. M. standards is being advertised and marketed as meeting these specifications. To eliminate this undesirable practice it is recomended that purchasers secure a guarantee from the dealer that apparatus purchased for use in carrying out such standard methods of the society meets with all the specifications of the method.

"And that instances of failure to secure apparatus in conformity with A. S. T. M. standards be reported to the secretary of the committee."

It is pointed out that some instrument making concerns, both German and American are putting out testing apparatus bearing the initials "A. S. T. M. Standard," which really does not conform to those standards. The oil man buying this apparatus is gypped in two ways. In the first place he is almost certain to get apparatus of inferior quality and even more serious, he is sure to be involved in many arguments with his customers over the quality of products if the seller tests them with these inferior instruments and the buyer tests them wtih apparatus conforming to the true A. S. T. M. standards.

# A Sample of "Bunk" Writing on Oil Substitution

POPULAR SCIENCE MONTHLY
*SUMNER N. BLOSSOM, Editor*
*November, 1926*

## *It Ruins Your* CAR *and Costs You* MONEY

# Bootleg OIL

### How unscrupulous dealers sell you inferior substitutes, endangering your car and even your life—Ways you can protect yourself

*By Myron M. Stearns*

DOWN a concrete grade in New England one day last summer a small touring car rolled gaily. At the wheel was a middle-aged man; his wife sat beside him; four children filled the tonneau. Baggage and camping outfit on the running board proclaimed them through tourists. With no other car in sight, the head of the family let 'er flicker right along. He was doing all of forty at the foot of the grade, and for the next rise he opened the throttle wide.

Not far away, in an adjoining clump of woods, I was hiking along a path leading to my vacation camp, when I was startled by the shriek of grinding metal, punctuated by the crash of breaking steel. I raced toward the highway.

What I saw was tragic. The small car had come to an abrupt stop, and the owner still sat at the wheel, apparently stupefied at the catastrophe. Broken pieces of connecting rods scattered over the road, smashed crank shaft, seized pistons, and ruined cylinder block had, in a fraction of a second, converted a pleasant outing into a bill for repairs that would mount into hundreds of dollars. A casual examination of the jammed and "frozen" parts of the wrecked motor was enough to reveal the story of what had happened:

Another car, and another family, had fallen innocent victims of bootleg oil!

Bootleg oil! It is the name of a new and gigantic scandal that has come upon us all unnoticed, picking our pockets, increasing repair bills, robbing us of motor car satisfaction, and even endangering our lives. It is a scandal that is costing you and me and other American automobile owners nearly a billion dollars a year in unnecessary expense. What does it mean?

It means that at least once out of every five times that you purchase oil at a roadside filling station you will not get the kind of oil you ask for. Possibly you may get another oil just as good, but the chances are that the stuff poured into your crank case will be a low grade substitute, or adulterated oil, or even used oil from some other motorist's crank case, that endangers the life of your car.

THIS is not a guess, nor merely an opinion. It is a proved fact, established by recent authoritative investigations conducted in various parts of the country—investigations which have brought startling revelations of a nation-wide graft in lubricating oil. They have revealed an insidious form of piracy springing up by the roadside to imperil and rob you and your family at every turn. In many cities the investigations are still going on. Today they are impressing on us the warning that unless we exercise extra caution whenever we purchase oil, any one of us, at any time, may find ourselves in the same predicament as the family of motorists which I saw come to grief on the New England hillside.

Think of it! At least one chance in every five that the service man may fill your car with a substitute lubricant, and that this substitute may be one that

### What Poor Oil Does to Your Car

It causes excessive wear and tear on every moving part.

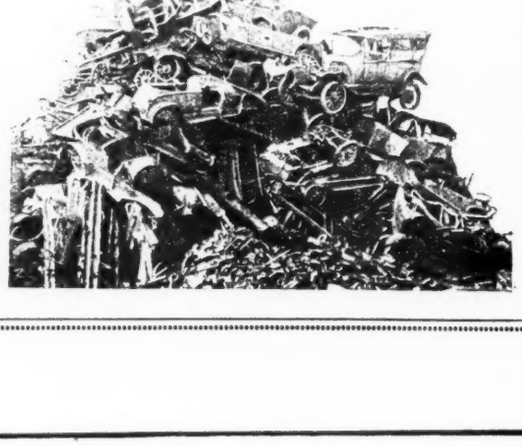
It may smash the connecting rods; break the crank shaft, "freeze" the pistons, ruin the cylinder block, or bring on any number of troubles that mean big repair bills, or even dangerous accidents.

It "gums up" the cylinders and other moving parts with foreign matter, carbon, and splinters of metal.

It overheats your engine and makes it noisy.

It takes all the enjoyment out of motoring.

It sends your car to the junk heap long before its time.



# Magazine Article, Citing "Investigation" Urges State Substitution Laws

HERE'S another sample of libelous ignorance, or it may well be viscious libel on the oil industry resulting from the campaign against alleged motor oil substitution, which has been taken to the public through the American Fair Trade League of New York.

Read the headlines and first page of the story on the opposite page from the November number of POPULAR SCIENCE MONTHLY and see if you don't feel like getting a gun and shooting up all who have been parties to this campaign on alleged substitution of motor oils.

If you think the campaign so far carried on is not going to cause you much trouble, read the following paragraph from this same POPULAR SCIENCE MONTHLY story:

> "Indeed, to such alarming proportions has this illicit traffic grown that two states recently have passed laws making it a criminal offense for any dealer to fill an order for lubricating oil for an internal combustion engine with a substitute or spurious article. Similar laws will be placed before the legislatures of 42 states for action early next year."

And at the end of the story it emphasizes that point of legislative action. The author says: "When the legislators of 42 states meet early next year to enact measures making it unlawful to sell substitute or spurious oils, you can help to place these measures on the statute books and stamp out a growing national swindle."

There are only two states that have this law, California, and New York. In neither state was the law fairly presented to the legislators. There was no open opposition to it, although the oil industry was opposed, because the law doesn't mean much, and the evil aimed at is inconsequential in proportion to the total amount of legitimate lubricating oil sold.

This author in POPULAR SCIENCE MONTHLY uses all the language available to describe the particular degree of crime that he thinks has been committed in this oil substitution business. He says:

> "You and every other motorist today are literally being robbed to fill the pockets of 1000 road-side dealers and unsupervised service men. So the greed of the unscrupulous minority that infests every trade until an awakening public curbs its illegal activities, has developed this astonishing new system."

And then he revamps the figures arrived at by the American Fair Trade League and finds that there are $250,000,000 of unnecessary wear and tear to all the cars in the country in a year. He bases this on the statements of the American Fair Trade League that a minimum of 25 per cent of all the lubricating oils used by automobiles are worthless, ruinous oils for the cars. Just how the American Fair Trade League ever arrived at this percentage, it never has said. It seems to have jumped to a conclusion from inspecting a handful of shyster service stations around New York and Albany.

But after valiantly damning the oils that are used for substitution purposes, the author of this POPULAR SCIENCE MONTHLY quotes some details from the report of Henry James Masson, Assistant Professor of Chemical Engineering, New York University to the American Fair Trade League, a report which the League and Mr. Masson have both refused to give to the oil industry.

The report says that the particular kind of oils which Professor Masson and his investigators, so-called, asked for, tested as follows on the average:

**Alleged Genuine Oil**

| | |
|---|---|
| Specific Gravity | .9300 (average) |
| Flash Point | 375° F. (minimum) |
| Fire Test | 420° F. (minimum) |
| Pour Test | 35° F. (maximum) |
| Viscosity | 495 seconds (average) |

The samples of the oils picked up from 33 out of 42 dealers who were asked for the "genuine" article, so-called, and which samples Professor Masson says are a substitute of the oil asked for, tested in the following ranges:

**Alleged Substituted Oil**

| | |
|---|---|
| Specific Gravity | .8902 — .9506 |
| Flash Point | 330° F. — 420° F. |
| Fire Test | 380° F. — 475° F. |
| Pour Test | 20° F. — 40° F. |
| Viscosity | 191 seconds — 575 seconds |

Interpreting the specific gravity into A. P. I., that of the so-called genuine article would run about 20½ degrees, and that of the substituted oils would run from 17½ to about 27½ Baume.

Lubricating oil experts say these specifications suggest that the "genuine" oil asked for is that of a well known national advertiser and that in the substituted oils, so far as shown by the specifications, it is quite probable that Professor Masson picked up a sample or two of Texaco light—maybe a sample of Veedol light and probably samples of other national branded oils, and maybe even samples of the "genuine" oil but of another grade than that asked for.

Lubricating experts say that it is also evident that some very good Texas and Gulf Coast lubricating oils were sampled, to say nothing of good oil from all other fields.

While substituting by these dealers in these cases certainly is a nefarious thing and one that the whole oil industry should condemn, the fact remains that the author's condemnation of the oils is most ridiculous. He says, for instance: "The body of some of the bootleg oils ran as low as 191—that means roughly less than half as 'thick' as the reliable oil and with less than half its lubricating qualities. .....

"Or compare the figures for flash point and observe that some of the substitute oils begin to break down at a temperature 45° lower than the reliable oil asked for. The same relative condition is true in the case of the fire test. Some of the substitutes burn at a temperature 40° below that at which the high grade oil will still do its work efficiently. You can readily realize what the effect of such a condition would be in case your engine should become heated in climbing a hill, or the water should run low in your radiator—where the good oil would stand up under the increased heat, the poor oil might burn and break down, failing further to lubricate the bearings and causing either a bad smash ,or at best. damaging wear and a costly repair bill."

And then further he says, "There exists cheap, low-grade oils without necessary body for safe lubrication which these gyp dealers can buy for prices as low as 15 or 20 cents a gallon. By selling this stuff to you at 25 or 30 cents a quart under the guise of a standard brand, these dealers make any-

where from 400 to 700 per cent profit." The author is evidently one of those investigators who do not know how to figure profit and confuses gross margin with net profit, very much like some other alleged economic authorities have in the past when discussing the oil industry.

It is also interesting to see how vigorously the author condemns the grades that are the same as some of the oils that are so heavily advertised in the Saturday Evening Post. It naturally raises the question—what chemical change takes place in an oil when it is advertised in the Saturday Evening Post which seems to make it a satisfactory lubricant, whereas when it is not advertised, oils of those same specifications cause cars to drop to pieces on every hill-side?

What the author overlooks and what has been overlooked by most of the zealous adherents to this substitution campaign is, that what causes bearings to burn out is not so much the grade of the oil, as a stopping of the oil to the bearing.

The sad story of the man and his happy family climbing up the hill in their flivver as told at the beginning of his article and then having the car just squash to pieces on the road, is a fair indication of the line of evidence which is accepted as complete in these tirades against alleged substitution of motor oil.

The author does not say, and it is practically certain that he did not make the kind of an investigation of that wrecked car necessary to determine whether or not it was running on a so-called cheap or inferior grade of oil and whether or not it was the character of the oil which caused the car to break to pieces or mechanical trouble. So far as the author's story goes, it might have been trying to run up that hill on the best grade of oil ever advertised in the Saturday Evening Post.

In view of the assertions made in this article and at other times that 42 state legislatures this year will be asked to enact legislation on this subject, the oil industry has a right to ask those who may be back of this campaign on oil substitution to come out from behind the smoke-screen and make a fair presentation of their case, if any, to the oil industry and give the oil industry opportunity to check the facts and then see if it can't devise a solution.

But then again there may not be anybody behind the smoke-screen but some of these gentlemen who try to hang on to every proposition that threatens to give them a little money and who are never of any industry and are never for any industry.

The American Petroleum Institute and every oil association could well take cognizance of these libels on the industry and demand a showing of hands.—W. C. P.

# Pure Gets Sweet Lake Well At Depth of 5897 Feet

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, Oct. 18

THE deepest producing well in the Gulf Coastal province of Texas and Louisiana has been completed at 5897 feet by the Pure Oil Co., drilling in the bed of Sweet Lake, Cameron parish, La. The well came in spraying oil with estimated maximum open flow gas volume of about 60,000,000 cubic feet daily. It is estimated to have made as high as 300 barrels daily of oil testing 29.6 gravity at 66 degrees F., part of which was saved from the start.

After several days the well is now pinched down with three-sixteenths inch choker, making 6,000,000 to 10,000,000 cubic feet of gas daily and 100 to 110 barrels of oil. The rock pressure back of the gas is estimated at 2500 pounds per square inch, it having shown an increase since the well blew in earlier in the week.

The present completion is the third test of the Pure Oil Co., in 12-13S-8W, Cameron parish, where it is developing a state lease in the bed of Sweet Lake. The prospective oil pool is controlled in its entirety by the Pure, which holds a total of about 10,000 acres in and surrounding Sweet Lake.

A first test drilled 800 feet southwest of the present well blew out at 4503 feet, making about 20,000,000 cubic feet of gas. That hole was lost entirely. No. 2 was later located 400 feet northnortheast of the present well, drilling to total depth of about 5300 feet before cutting and pulling liner to take care of mechanical grief. That test, which is still giving mechanical trouble, made about 10,000,000 cubic feet of gas and small "heads" of oil at 5205 feet.

A detailed article dealing with Sweet Lake operations of the Pure Oil Co. appeared on pages 69-70 of the July 14, 1926 issue of this periodical.

### Will Lay Gasoline Line

LOS ANGELES, CALIF., Oct. 16.—The Shell Co. has secured permit from authorities of Ventura County to lay a 6-inch gasoline line and an 8-inch crude oil pipe line from the Ventura Avenue field through the county. These lines will terminate in the Los Angeles Harbor district where the Shell's refinery is located. At present a 3-inch line, only, for moving natural gasoline, will be laid. The crude line will await further developments in the field, although it is deemed certain it will be laid before spring.

### Texas Traffic Manager Recuperates

TULSA, Oct. 16.—Ed P. Byars, manager of the North Texas Traffic Bureau at Fort Worth, the freight rate bureau of North Texas refiners, is back at work after an illness of several month's duration. He was in a hospital at Denver.

# Refiners Ask Substantial Rate Reductions

(Continued from page 58)

The same situation was reported in the case of shipments to the territory north of the Ohio river and east of the Indiana-Illinois state line. Mr. Yeager showed that in 1921, 23 per cent of the company's production went to Central Freight Association territory, in 1923 only 1 per cent and in 1924 and 1925 only 4 per cent.

High rates, he said, have forced the company into the export business. During the first five months of 1926 the company shipped 40 per cent of its gasoline to export and the percentage ran as high as 48 per cent some months.

Comparing transportation rates from well to consumer Mr. Yeager stated the American must pay 60 cents per barrel more to move its goods by pipeline from the well to its refinery and thence by rail to the southeast than Gulf Coast refiners who move the oil by pipe line to their plants and thence by boat to South Atlantic ports and by short rail haul inland.

At the session the 16th W. W. Klingensmith, traffic manager for the Transcontinental Oil Co., presented the ground work for his attack on rates to the southeastern states. He will present the remainder of his case following completion of the case brought by Mid-Continent refiners against rates to the northeast.

A. T. Sindel was placed back on the stand by L. D. Sumerwell, traffic manager for the Manhattan Oil Co., to show rates from Kansas City to the southeast to be too high.

# Drilling and Production Practices In Mid-Continent Greatly Improved

By J. R. McWilliams
Skelly Oil Co., Tulsa
*Before Fall Meeting, Petroleum Division, A. I. M. E., Tulsa, Oct. 11-12*

THE task of recovering most of the contents of an oil and gas reservoir economically presents many and varied problems. In order to attempt intelligently a solution to these problems, an understanding of fundamental physical laws is essential. As the pertinent facts needed in applying these laws to recovery problems are not readily obtainable, observation must be made and the data tabulated. Here, good judgment must be exercised, for at best the information is meager.

The engineer is well fitted to undertake the task of solving this problem. In my opinion, the decision on the part of some production executives to allow the engineer to cope with the oil recovery situation and other problems, is an outstanding example of improvement in production methods. The executive head must make this decision or the qualified engineer will be working under a severe handicap with the present system of supervising the production of oil and gas.

A qualified engineer should have not only the required technical training but also enough field experience to enable him to understand the difficulties encountered in producing oil and gas. Such a man tactfully cooperating with the practical oil man can greatly improve present methods of oil recovery. The realization that nature's forces have not been efficiently controlled in past recovery of petroleum deposits has recently brought distinct improvement in production methods.

The application of back pressure to producing oil wells has not, to my knowledge, been extensively applied in Oklahoma or Kansas up to the present time. Most of the flowing wells are allowed to flow through the casing until the rock pressure has been dissipated. However, some flowing wells have been tubed before the well stopped flowing through the casing. Recording pressure-gages can be installed to study well performance.

### Use of Gas Lift

IT is interesting to note that the application of vacuum to pumping wells is becoming a questionable procedure, at least up until the time of rather small rock pressure. Gas-lift flowing of wells is becoming extensive in Oklahoma, especially in the districts producing from the deeper horizons. A visit to several of these installations leads one to the conclusion that on the whole the machinery is running at over-capacity and the efficiency of the gas lift is rather low, certain installations excepted. However, when one considers that the gas-life installations in Oklahoma and Kansas are less than one year old, the results accomplished are exceptional.

### Use of Compressed Gas or Air

THE practice of rejuvenating oil sands by the use of compressed gas or air is spreading in northern Oklahoma and eastern Kansas. On the whole the results are satisfactory. The time is not far distant when the gas from flowing wells will follow a cycle through the gasoline plants, be recompressed and forced back into the oil sands before the rock pressure has become dissipated.

### General Practice

THE use of the combination rotary-cable tool drilling equipment is progressing northward through central Oklahoma. Most of the objection to rotary tools has been removed through the use of satisfactory ore drills. Seamless casing is widely used for strings over 3000 feet.

Cementing water strings has decreased operating troubles. Calcium chloride and the commercial accelerators are used in cementing jobs. Long strings of pipe are floated into place and a satisfactory shoe with suitable valves is available, which does away with the risk involved in raising a string of casing off the casing seat while cementing. Time bombs are very satisfactory in shooting operations.

The wooden rig is practically extinct. Combination steel and wood, together with all-steel rigs, are used almost exclusively. Chain-driven sand reels are economical on wells below 3000 feet. Steel-constructed engine houses are becoming common and sometimes the belt house is of this construction. Well braced jack posts and Sampson posts are securely set in concrete foundations in many installations. Steel pitmans and bull wheels are very common, with fewer steel walking beams and band wheels.

Gas or oil engines are economical and satisfactory on drilling wells in those areas where fuel or water is scarce. A portable pump directly connected to a gasoline motor is widely used for small intermittent pumping jobs. Efficient burners are used on drilling boilers and sometimes exhaust steam is passed through a heat interchanger to raise the temperature of the boiler feedwater.

### Pumping and Pulling Equipment

A PUMPING unit using a reduction gear between the prime mover and the crank increases mechanical efficiency considerably. A chain hoist is used for pulling operations, mostly in connection with the electric motor. Wells have been drilled-in with this equipment. A well designed counter-balance is standard equipment on one particular unit.

The enclosed type of pumping engine with counter-balance crank shaft and force-feed lubrication is available. Water softener is used to a great extent in circulating water for engines. Clutch troubles are decreasing with better designed equipment. One manufacturer has a satisfactory clutch on the market that does away with reverse gears. The use of tractors for pulling rods and tubing has decreased engine and clutch troubles markedly. The time required for pulling operations has also been materially decreased by the use of tractors.

Several hydraulic long-stroke pumping units are in use in Oklahoma and Kansas. Favorable results are reported. An oval-gear long-stroke pumping attachment has been recently put on the market. As yet it has not been used extensively but the design affords control of acceleration during the proper part of the pumping stroke. This factor has a great effect on the life of pumping equipment.

A counter-balance attached to the band wheel is commanding attention, especially where installed on deep pumping wells. Here pumping equipment is taxed to capacity and an effective counter-balance is absolutely essential in consistently handling large volumes of fluid. Rod hangers have not been used extensively but their use is increasing. A satisfactory tubing bleeder is on the market.

Band-wheel power installations are pumping wells over 3000 feet deep. The counter-balance jack with a vertical pull on the polish rod is effective on this type of well. The fluid-packed pump, although not possessing a high volumetric efficiency, yields results on wells that really should be cleaned out or that have floating sand.

### Welded Stock-tanks

The purchase of oil on a gravity basis has been an important factor

toward conservation. Welded stock-tanks are yielding some excellent results in the retention of the gravity of oil. The big advantage of welded tanks over the bolted tanks is that they stay tight. Two other advantages are portability and increased thickness of metal per dollar investment. Welded tanks are limited in size on account of portability and, therefore, are not adaptable for the total stock-tank installation on flush production. The usual procedure is to install enough welded tanks to care for the estimated future settled production and use large bolted tanks for the remainder of the flush oil.

### Many Tanks Replaced

THE SKELLY OIL CO. has replaced the bolted tanks on 72 of their properties, located in Kansas, Oklahoma and Texas, with 279 welded tanks. The object of this change was to eliminate the cost of "cutting down" and erecting the bolted tanks whenever it was necessary to salvage them and also the cost of intermittently repairing the bolted tanks in order to attempt to keep them tight. Cost records disclosed that this expense exceeded $25,000 per year on the lease tanks as a whole. Experiments indicated that the gravity and volume of the oil could be maintained in tanks that were constantly tight. The tanks have been in use practically a year and the results obtained more than justify the change and conserve products which would otherwise have been wasted.

The 279 tanks have a capacity of 33,-855 barrels. The cost of installation was $74,327.89, or $2.19 per barrel capacity. The bolted tank equipment was salvaged and the salvage value credited to the cost of installing the welded batteries. 1,185,790 barrels of oil have been run through these tanks since their installation. The estimated saving on account of retained gravity amounted to $73,-445.07, or $0.0619 per barrel, and the estimated saving on account of retained volume amounted to $45,563.10, or $0.0384 per barrel, making a total gross estimated saving of $119,008.17, or $0.10 per barrel. Subtracting the royalty owners 12½ per cent interest, leaves $104,132.11 as the estimated profit to the operator. As the cost of installing the tanks amounted to $74,327.89, the investment was returned in approximately seven months and an additional 40 per cent realized at the end of the first year on the installation as a whole. On a property basis, 27 per cent of the installations produced 57 per cent of the oil and paid out in the first year; 11 per cent of the installations produced 9 per cent of tre oil and should pay out in the second year; 10 per cent of the installations produced 6 per cent of the oil and should pay out in the third year; 42 per cent of the installations produced 28 per cent of the oil but did not raise the gravity of the oil into the next higher price classification. This does not necessarily mean that these installations have not been profitable from a gravity volume standpoint.

The estimated profit due to the retention of the gravity and volume of the oil was calculated on the following basis. The amount of oil produced in each gravity classification was totaled for the six months preceding the installation of the welded tanks. Using the present market quotations for oil with an eight cent differential per degree of gravity per barrel, the average price per barrel was obtained for the oil sold during the six months' period. In a like manner. the average price per barrel was obtained for the oil run after the welded tanks were installed. The difference gives the estimated profit per barrel on account of the installation of welded tanks. The increase on account of volume was calculated on the basis of 2 per cent in volume per 1° A. P. I. increase in gravity for oil above 39° A. P. I., 1½ per cent per 1° A. P. I. for oil between 32° and 39° A. P. I. and 1 per cent per 1° A. P. I. for oil below 32° A. P. I.

The ratio of increased profit per barrel received for the oil after the tanks were installed to the eight cents differential per barrel used in calculating the average price, determined the number of degrees increase in gravity. The basis of calculations should yield conservative estimates.

### Treating Emulsified Oil

A RECENT installation for treating emulsified oil has yielded some surprising results. The oil and water are pumped through a boiler where the temperature is kept constant by a heat controller. The wash tank, settling tanks and pipe line from the boiler to the tanks are insulated. Insulating this equipment enables a reduction in the temperature required for treating from 180° to 120° F. The temperature of the oil in the settling tank is constant regardless of weather conditions. The result is clean oil at a lower temperature.

The gas that is boiled out of the oil, due to the necessity of heating, is collected in the welded treating tanks. These tanks will withstand sufficient pressure to force the oil and gas through a system of coils where the cooled oil re-absorbs the rich gas vapors driven off by the heat. The salt water sprayed over the coils comes from the wells and is separated at the first receiving tank.

The oil is discharged into the stock tanks through submerged nipples. Gage glasses are installed on the sides of the tanks with a suitable gage pole arrangement so that the pumper can obtain his daily gage or "top out" a tank without opening it, which would intermittently release the gas vapors in the tanks. The gravity of the oil on this particular installation has been increased from 2° to 3° and the oil is practically clean.

### Production Records

EXCELLENT results are being obtained by the inauguration of a system of pertinent production records. These records are extremely valuable in reflecting operations for the supervising heads. For instance, one company keeps a graph, platted daily, of the oil, gas, gas factor and gravity of each tank of oil run from each individual property. At a glance one can grasp the situation and have a comparison of records over a period of time. A down-time report showing the number of hours a well is off production and the specific cause of interruption is required. This information is totaled semi-monthly and posted to a summary. A marked deviation from the average down time for any specific reason is cause for investigation and remedial measures.

A replacement record on equipment is beneficial in determining faulty products. Several of the major companies have equipment standardization programs under way.

### Employee Welfare

THE welfare of employees is receiving more and more attention. Safety-first bulletin boards are in evidence on many leases, as in manufacturing plants. Competent men circulate among the various districts of their company lecturing to the workmen on the merits of safety-first policies.

Several of the companies require a medical examination before a man is employed. This practice benefits the employee as well as the company. Larger dwelling houses equipped with bathing facilities are increasing. Schools are provided in remote districts. Bonuses, vacations, insurance and stock at reduced prices are often available for deserving employees.

To those who are thoroughly familiar with the production in the oil industry, evidently a progressive program of determining and practicing more efficient and conservative methods of producing oil is being universally adopted.

## Through-Canal Cargoes of Oil Fall Off

LOS ANGELES, Oct. 18.—The movement of the fuel oil, gasoline and crude oil out of Los Angeles Harbor through the Panama Canal to points on the Atlantic Seaboard and to Atlantic foreign ports has been rather encouraging recently, and during the two weeks ending with Oct. 9, the movement through the Canal from Los Angeles Harbor only included 590,992 barrels of gasoline, 631,496 barrels of fuel and 470,375 barrels of crude.

All of the crude, with the exception of one cargo to Atlantic foreign, went to Atlantic Seaboard. During the two week period, 403,331 barrels of fuel moved to foreign points through the Canal, with 228,165 barrels to Atlantic Seaboard. Movement of gasoline reached a total of 590,992 of which 419,311 barrels went foreign.

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## DISSOLVED ACETYLENE

# Large Production Gain Results from First Major Air Drive in Okla.

By J. E. Roth
Engineer, Air Department, Tidal Oil Co., Tulsa
*Before Fall Meeting, Petroleum Division, A. I. M. E., Tulsa, Oct. 11-12*

BECAUSE of the great vogue the pressure application to oil sands is now undergoing, it is interesting to follow the history of the first major air installation in the Mid-Continent field.

In the spring of 1924 when this plant was built there were no successful air plants operating in Oklahoma, although three small gas drives were making a success. In Texas it had not been tried at all and so far as we know there were only five successful plants in Kansas. There were twelve failures in Kansas in the Chanute area at this time.

In July 1926 just two years later, we made a survey and found upward of 80 plants operating or building in Oklahoma. In Kansas there were 22 successful plants, seven failures (not mentioning the abandoned plants near Chanute) and six building, while Texas had entered the race and boasted of 10 operating plants.

### History of the Elliott Pool up to the Time of Air Installation

THE Elliott Pool of some 605 productive acres of Bartlesville sand, lies mainly in Sec. 3, Twp. 27, R. 15 E. This is four miles west of the village of Lenapah on the Nowata-Coffeyville road and lies just north of the Delaware extension of the Nowata field. It is owned jointly by the Prairie Oil and Gas Co. and the Tidal Oil Co. and is operated as a unit pool.

From available records the discovery well was brought in during October 1909 with an initial production of 275 barrels, per day. The pool was drilled up during the fall of 1910 and the spring of 1911. During this time 111 wells were drilled, averaging about 250 barrels, per day, initial production. There was a good uniform gas pressure over the pool and some of the wells flowed.

In Nov. 1912 vacuum was applied and was probably successful as it was continued until July 22, 1924, when air broke through into two wells causing the vacuum pumps to go down. They were never used after that date.

Now at the start of 1924 we find 82 producing wells averaging about .53 barrels per day. It might be well to show right here how close to the economic limit of exhaustion this property had come. From a perusal of the available logs we find an average sand thickness of 38.8′ divided as follows: gas sand 15 ft., oil sand 20 ft., unproductive sand 3.8 ft. These same logs indicate that there is no water in the sand and that the gas is uniformly spread through the pool.

By drawing a line around the pool through the outside wells and figuring the area contained we determined that there are about 605 productive acres. This equals 12,100 acre feet of pay sand.

Using A. F. Melcher's figures of 16.1 and 16.6% porosity from two samples of Bartlesville sand, taken a few miles west of here, we will assume a porosity of 16% for the pool. Considering also that this twenty feet of sand as completely saturated we get

12,100 acre ft. x 43,560 sq. ft. /acre x .16
5.6175 bbls. /cu. ft.

or about 15,000,000 barrels of oil originally in the pool.

We have actual gross production figures for the four years from 1919 to 1923, and by constructing a decline curve on a well basis on log paper in the reverse direction we find that about 1,700,000 barrels or 11.3 per cent of the original content has been produced.

Now continuing the curve the other way, we find that only 135,000 barrels or .9 per cent of the original content of the pool will be produced from 1924 to 1934. This would seem to indicate that, as far as ultimate production is concerned, the Elliott pool had just about reached its limit and something had to be done to rejuvenate this production. In this case pressure was tried and its effects will now be studied.

### Installation and Application of Pressure

TWO 110 HP direct driven Watts-Miller Improved gas engines which delivered about 800,000 cu. ft. per day to the sand, were originally put in the plant. They soon proved inadequate and a third engine of the same type was added in January, 1925.

This installation is about the same as is used in compression casinghead gasoline plants. The old vacuum lines were used as a gathering system for the returning casinghead gas and a new system of lines was constructed to carry the air-gas to the pressure wells.

At the plant the gas not required for fuel is brought around to the compressors where its deficiency in volume is made up with air and the resulting mixture compressed and sent to the field. There was one line explosion at the plant during an electrical storm in 1924 which indicates the danger of air-gas mixtures. We have here 42% of Gas and 58% of Air in our air lines now which seems to be above the burning range. The danger of these mixtures and the precautions used will be discussed later.

The air wells have rag packers run in on the tubing and cemented just above the sand as is described by J. O. Lewis in Bulletin 148, U. S. Bureau of Mines. They are selected after a study of well and underground conditions so as to get maximum effects from the fewest wells. We will consider the efficient spacing of air wells later in this paper.

The engines were started up June 26, 1924, and on July 12, 1924, continuous operation was begun with air under 180 lb. pressure going into six wells called "air" wells. On July 21, 1924, air broke through into two oil wells and the three vacuum pumps were shut down.

With the shut down of the vacuum system production went all to pieces, falling to only 7 per cent of the production before air. All but four of the wells stopped pumping for at least a few days, but gradually as the air drive reached them, they came back on production. There were several edge wells, however, that did not pump a drop for over a year.

From Aug. 15 on through the fall of 1924 and all of 1925, production steadily increased until we had an increase of 400 per cent. During 1926 there has been little change due to low pressures caused by down time for reworking the engines and an increased volume going into air wells.

It is interesting to watch the spread of air and notice its influence upon production. At Lenapah all oil wells are tested monthly for increased pumping time, increased casinghead gas volumes and air percentages. The air wells are also tested so we know which ones are taking the most air and really affecting a big area. These tests are of great value in securing efficient air operation as any sudden increase in volume of both an air well and a nearby oil well is noticed and steps for the prevention of blowing through, or by passing, are immediately taken. At Lenapah we have been fortunate and have had no serious trouble with blowing through.

### Factors Affecting Efficient Operation

(A) Location of Air Wells

EARLIER in this paper we mentioned how air wells are made and now we will discuss locating them Only six wells were used at first and the rest were added from time to time in places

where a study of conditions showed that they were most needed.

Of the six original pressure wells, four have been abandoned due to various conditions. Two air wells were located along the east side of the pool and were expected to drive the oil in from that side of the pool. However, they are in a broken formation and would not take air at the pressures obtained at this plant so have been disconnected.

No. 34 Edna Adair, near the plant, did some good originally, but water commenced leaking into it and drowned it out. It was considered cheaper to drill an air well beside it rather than to drill it out and fix it. This new well is affecting a large area.

On the south end of the pool we had a good air well taking over 100,000 cu. ft. of air per day. This volume, however, did not affect nearby wells so probably it was going off into the old abandoned gas field to the south. For this reason the well was abandoned and another well northwest of it was used to replace it. This new well has made several edge wells produce that had not pumped for over a year.

The wells picked later, after the trend of the air travel had been established, were uniformly successful and have ensured an even spread of air over the pool.

(B) Oil-Gas Ratios

The ratio of the amount of gas per barrel of oil produced is an interesting indicator of the efficiency of air plant operation.

Herewith we show these ratios for two leases, one the Edmond Elliott Lease situated in the center of the pool, the other the Dora Elliott Lease located on the north edge.

BEFORE THE INSTALLATION OF AIR

| Year | Bbls of Oil | Cubic Feet of Gas | | |
|---|---|---|---|---|
| | | Edmond Elliott | Dora Elliott | Average |
| 1918 | 1 | 2025 | 4750 | 3340 |
| 1919 | 1 | 2420 | 4280 | 3350 |
| 1920 | 1 | 3175 | 4220 | 3700 |
| 1921 | 1 | 2522 | 7000 | 4760 |
| 1922 | 1 | 2235 | 5450 | 3840 |
| 1923 | 1 | 2485 | 3360 | 2925 |
| May 1924 | 1 | .... | .... | 2370 |

AFTER PRESSURE APPLICATION FOR ONE YEAR

| | | | | |
|---|---|---|---|---|
| Last 6 months | 1925, 1 bbl. oil | .... | .... | 3390 |
| First 6 " | 1926, 1 " " | .... | .... | 3640 |

From the May 1924 figures taken on the pool as a whole it can be seen that our operation has been efficient so far. Any sudden marked increases in the volume per barrel, would show lost efficiency and indicate by-passing for then the air would not be bringing out its quota of oil. As the sand is depleted the volume per barrel will continue to rise and by watching it we will have an indication of when our air application has about reached the economic limit of usefulness.

(C) Casinghead Gasoline In Connection With Air Plants

The status of gasoline plants in old depleted fields has caused much worry on the part of their owners. The gas from this pool was used by a gasoline plant and the shutdown of the vacuum plants cut off this supply, seriously affecting the life of the plant.

In May 1924 the pool averaged 164,000 cu. ft. per day, testing 4.60 gal. per 1,000 cu. ft. or 605 gallons per day. A few weeks after air was introduced the volume showed a big increase but the air-gas mixture tested only .28 gal. per 1,000 cu. ft. This value gradually increased until on Nov. 19, 1925, the mixture tested 1.28 gal. per 1,000 cu. ft. with a volume of 545,000 cu. ft. per day, containing 690 gallons of gasoline. In May 1926 it had increased to 1.56 gal. 1000 cu. ft. with 560,000 cu. ft. return gas and 874 gallons of gasoline.

The presence of these vapors in the gas caused considerable trouble in cold weather in filling all low places with fluid. To eradicate this trouble we constructed a set of coils and placed them with a scrubber tank in the high pressure system. This apparatus was put into use in January 1926 and made 200-250 gallons of gasoline per day with a pressure of only 135 lbs. These coils were placed to give the best air plant efficiency, their efficiency as part of a gasoline plant was not considered in this case. However, this summer, even during the hot weather we were able to obtain from 50 to 60 gallons per day.

Another thing to otfset the loss of gasoline revenue has been a 2° A. P. I. increase in gravity which, along with increased production and the gasoline now made, has more than made up for the loss of revenue from the old gasoline plant. Considering that gravity is increased and that a considerable portion of the gasoline can still be obtained and that with increased efficiency of operation in the future, this revenue will probably be still more increased, it would seem that giving over part, or all, of many little gasoline plants to pressure application may be a profitable thing for their owners.

(D) The Danger of Using Air-Gas Mixtures and Its Remedies

There has been no recurrence of the explosion of October 1924 which destroyed 400 ft. of 2" line, but measures were taken to minimize the danger of explosions and to cut down damages if they should occur. Immediately after the explosion, apparatus for collecting and cooling the exhaust gases of the engines, which amounted to about 500,000 cu. ft. per day was installed and this gas added to the incoming gas to give a non-explosive mixture.

With the installation of so called lightning arrestors which were joints of casing filled with steel shavings, operating on the Davies Safety Lamp principle, the exhaust gas system was abandoned. However, as there have been explosions at other plants having these arrestors on the lines, they seem of doubtful value except in case of violent explosions. Slow burning flames are slowed down apparently by these screens but do burn through them and go on down the line. Incidentally, stone or brass should be used in these in place of steel or iron, due to the possibility of iron sulphide forming which might, in the presence of the proper elements, act as a catylitic agent starting a flame itself.

At this plant we rely mainly upon having a safe mixture in our lines for protection against explosions. The air-gas mixture going to the wells now contains 42% gas, which would be almost impossible to ignite.

The best solution seems to be in separating the air and the gas, letting part of your compressors pump gas and the rest of them air. This might cut down your plant efficiency, at times, due to fluctuations in volume but it would be much safer.

### The Operating Cost and How It Is Affected By An Air Installation

IN considering an air plant installation the changes in operating costs due to air are of great interest. The addition in investment with added equipment would indicate a greatly increased operating cost which, however, is not the case in an efficient plant.

To begin with, the increased production, per well, tends to lower costs, per barrel, and offset the increased total cost. Then in this case it has been found satisfactory to pump only three times a week permitting pumpers to double up on leases and making it possible to pump the property with less men than ever before. The air forces the oil into the well so that it does not matter whether it heads up or not, for just as much oil can be obtained every other day as from daily pumping.

We require only one man to operate the plant, which operates twenty-four hours per day. No night man is used as the operator lives near the plant and with the aid of automatic shutdowns keeps the plant going. The plant-operator also farm bosses the property. The same number of roustabouts is used as formerly so there has been practically no change in payroll expense. The only big item of increase is repair parts and labor necessitated by the big increase in machinery.

In connection with operating costs an experiment was made in drilling more wells to increase production. Thinking that considerable oil was being lost due to a lack of wells in certain areas, fourteen wells were drilled about half of them along the east side of the pool and the rest scattered through the pool wherever it appeared that another well was needed. Two of these wells were dry and two were used as air wells leaving ten producers which have not produced over ten barrels per day and as air had already affected the area, no further increase can be expected. This would indicate that drilling oil wells in

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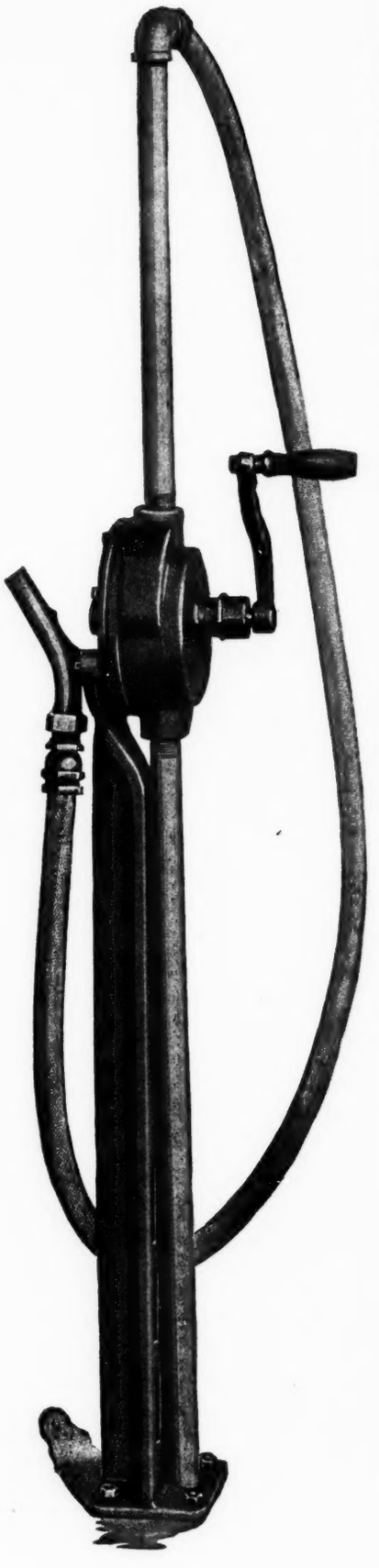

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The design and construction is simplicity itself. There are only five moving parts. No valves—no leathers to cause trouble—no springs—no adjustments of any kind. It is always smooth in operation. It is built on the Blackmer Pinciple of automatic-take-up-for wear which insures many years of troublefree service. Buckets are made from bronze to eliminate danger of rust. Has large capacity—pumps 12 gallons per minute. Makes positive suction lifts. No priming. Has 1 inch pipe connections.

*Furnished with continuous flow meter if desired*

For providing a measure of gallonage, this pump will be furnished with an approved continuous flow meter and a positive acting foot valve. Prices upon application.

The Blackmer "Big Boy" as shown in the cut at the right complete with an 8 foot hose and nozzle will be shipped upon receipt of $27.00. Write for quantity discounts.

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air properties is not worth while for their initial production is not as high as their settled production and a two or three barrel well will hardly pay out.

Only along the edge of the pool is there any oil that could have been considered unattainable with existing wells for the area drilled in the pool proper would have ultimately been affected. But one barrel wells cannot be considered economically worth while.

### Conclusion

REFERRING back to the results of Eastern plants, some of which although thirteen to fourteen years old, still make more oil than before air was introduced and considering that we have a four hundred percent increase in production, we can reasonably expect to produce about 3% of the original pool content in place of 9/10 of 1% to be expected from regular production during the next ten years.

Considering this as a typical first class air installation on Bartlesville sand, it becomes evident that with such an increase in yield, the application of air to this sand is profitable and in the conservation of our natural resources, necessary.

## Shell Co. First Aid Team Captures First Prize

NEW YORK, Oct. 16.—The distinction of being the first petroleum first-aid team to win the international championship during the 13 years these contests have been held, is claimed by the Long Beach production department of the Shell Co. of California as a result of its winning the highest score at the International First Aid and Mine Rescue contest held in San Francisco on Sept 2, 3 and 4. This team established a score of 99.3 points, among 46 competitors from 13 states, according to Richard Airey, Royal Dutch-Shell representative in this country.

Other states besides California that were represented at the contest were Arizona, Colorado, Kentucky, Illinois, Louisiana, Montana, Oklahoma, Virginia and West Virginia, Washington and Wyoming.

Prizes received by the Shell team as a result of its victory are:

Congressional bronze medallion, awarded by act of Congress, presented by the Department of Commerce, U. S. Bureau of Mines, for permanent possession;

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Silver cup presented by the "Colliery Coal Operators Association, Central Illinois Coal Operators Association, Fifth and Ninth District Coal Operators Association of Illinois, and the United Mine Workers of America, to be held until the next national or international contest; a large bronze cup presented by the Society of Safety Engineers of California for permanent possession; gold medal for each member presented by the National Safety Council; bronze medal presented by the Red Cross.


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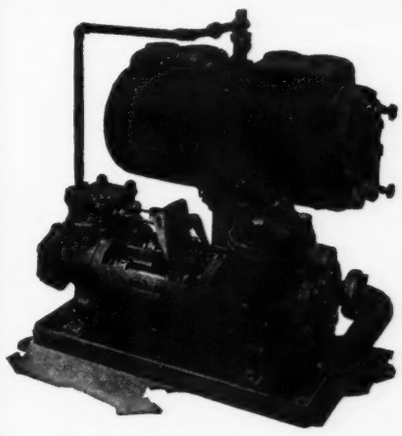

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# Dissolved Gas Has Effect Upon Surface Tension and Viscosity of Oil

By C. E. Beecher and I. P. Parkhurst
Production Engineers, Empire Gas & Fuel Co.
*Before Fall Meeting, Petroleum Division, A. I. M. E., Tulsa, Oct. 11-12*

*Several months ago Henry L. Doherty, head of the Cities Service interests, aroused much comment by his statements to the Federal Oil Conservation Board that through methods proposed by him the production of oil from new pools could be greatly increased. The principles upon which he based this claim are set forth in the accompanying paper, written by two engineers who conducted the experiments to prove the soundness of Mr. Doherty's argument.—Editor.*

IN the course of the experimental and development work of Henry L. Doherty in an endeavor to obtain an increased yield of oil from oil-bearing sands, it was Mr. Doherty's contention that oil in an undisturbed pool was different in character and behavior than the same oil when raised to the surface of the earth, and that the gas dissolved in the oil caused a marked reduction in its viscosity and surface tension.

Prior to 1924, no information to support this contention could be found in the literature or by a discussion of the subject with technical men in government and private laboratories. So far as could be ascertained no experimental work had been carried on to indicate that Mr. Doherty's claim was either right or wrong. All parties consulted agreed that the viscosity of the oil would be affected by gas dissolved therein to the extent that natural gasoline was present in the gas, but so far as could be determined any additional effect of the natural gas was unknown.

Accordingly, it was necessary to devise equipment and carry on experiments which would either prove or disprove Mr. Doherty's contention or claim.

Such apparatus was built under Mr. Doherty's direction and experiments were carried on to determine definitely the viscosity and the surface tension of the crude oils which contain dissolved gases under different pressures. The results of the experimental work carried on have proved that the claim and contention of Mr. Doherty were correct in every particular as will be seen from the discussion of the subject and the data contained in this paper.

At a pressure of 500 pounds, and a temperature of 70° F. it was found that a natural gas such as is associated with the oil would reduce the viscosity about 50 per cent when a given crude oil was

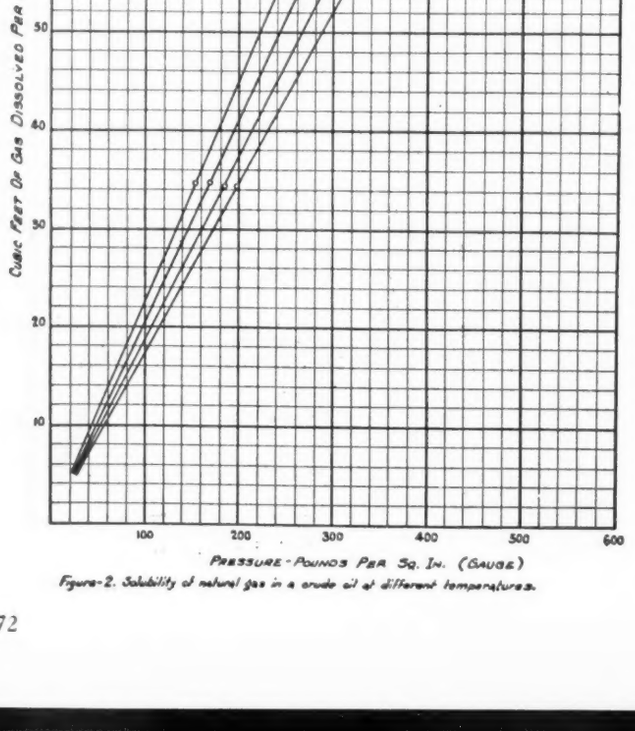

Figure-2. Solubility of natural gas in a crude oil at different temperatures.

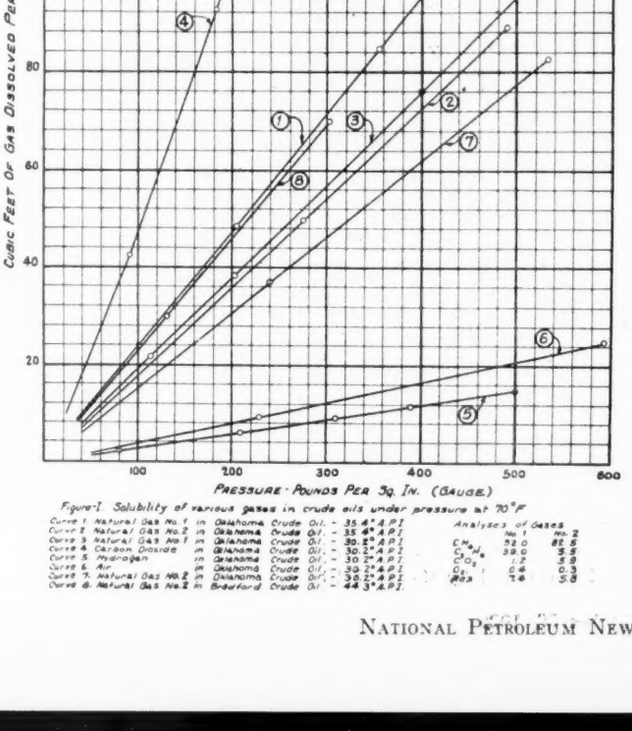

Figure-1. Solubility of various gases in crude oils under pressure at 70°F.

saturated with the gas. Increasing the pressure another 500 pounds could not be expected to reduce the viscosity the remaining 50 per cent. However, some reduction in viscosity would take place as indicated by the curves showing the relation between pressure and relative viscosity. Pressures of 1800 pounds may exist at depths around 4100 feet and at present a large amount of oil is being produced from much greater depths. Under such pressures sufficient gas might dissolve in the oil to make the viscosity almost equal to that of kerosene.

### Most Important Factor

VISCOSITY is the most important physical quality of oil which retards its flow through a pipe line or through the small irregular openings of the average oil sand, therefore, if some method of producing oil can be devised such that a major portion of the gas will remain in solution and the oil retain its fluidity it is possible that the volume of oil recovered from the sands can be greatly increased.

The surface tension of crude oil is reduced by dissolved gas. The results of experiments with two different crude oils saturated with gas at pressures from 400 pounds to 500 pounds indicate a reduction of approximately 20 per cent in the surface tension of the oils. Many of the small openings in an oil sand are of capillary size and hold a large per cent of the oil which is not recovered by present production methods. As the dissolved gas escapes from the oil the surface tension increases and likewise the capillary force which holds the oil within the sand. We are not prepared to say that surface tension is the only factor that holds the 80 per cent of the original oil in the sands. If, however, surface tension should be the only force and if by keeping the gas in solution the surface tension could be reduced by 20 per cent then we might expect an 80 per cent greater ultimate recovery from the sands.

### Reason for Large Wells

A GREAT volume of oil must flow through the sands at a rapid rate and for some distance to account for the large production of some wells. The expulsive force of natural gas dissolved in and associated with the oil, the rock pressure, the reduction in viscosity due to increased earth temperatures and other factors do not alone offer an explanation of the large gusher wells. It is believed that the flow of oil through the sands in such large volumes is only possible because of the reduced viscosity and surface tension of the oil resulting from the gas in solution.

It is the purpose of this paper to give some of the results obtained from the experimental work on the solubility of gas in oil under pressure and the changes in the viscosity and surface tension of the oil. The authors wish to acknowledge the many helpful suggestions offered by A. W. Ambrose.

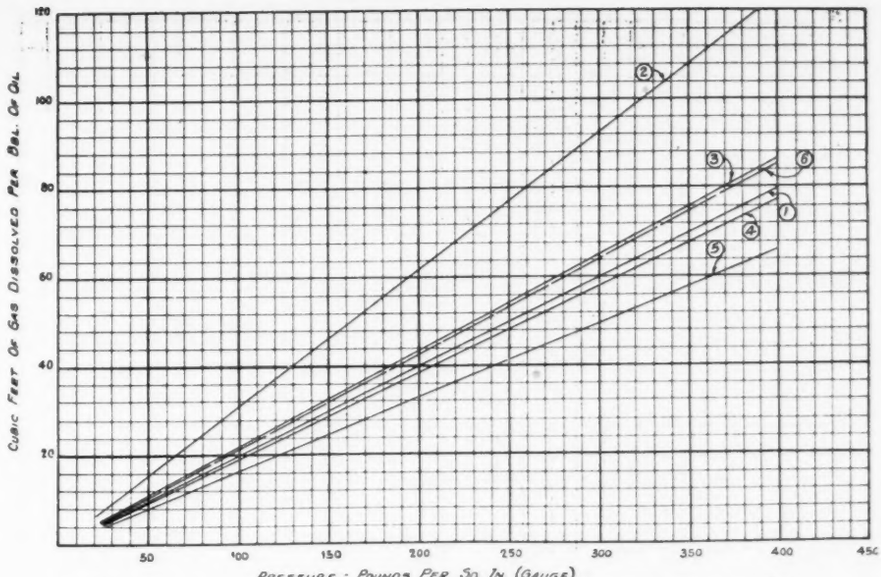


Figure-3. Solubility of natural gas in an Oklahoma Crude Oil (36.6° A.P.I.) and in its refined products at 78° F

| | | Analysis of gas | |
|---|---|---|---|
| Curve 1. | Crude Oil | $CH_4$ | 82.5 |
| Curve 2. | Gasoline | $C_2H_6$ | 5.5 |
| Curve 3. | Kerosene | $CO_2$ | 6.9 |
| Curve 4. | Gas Oil | $O_2$ | 0.3 |
| Curve 5. | Fuel Oil | Res. | 5.8 |
| Curve 6. | Composite Curve | | |

### Method and Apparatus For Determining Solubility of Gases in Oils

THE apparatus used for determining the amount of gas dissolved in oil under pressure.....consisted essentially of a large chamber . . . and small chamber.....connected at each end..... The total void space in the apparatus was 45 cu. in. Chamber B had a capacity of 14 cu. in. when the valves at each end were closed. The method of operation was as follows:

Approximately 20 cu. in. of oil was placed in the apparatus and the gas pressure applied. The whole apparatus was then agitated to insure intimate contact between the oil and gas. As the gas absorbed, the pressure dropped until the oil was completely saturated. When this point was reached, the entire apparatus was placed in a constant temperature bath for sufficient time to insure uniform temperature. During this period, it was agitated several times to further insure complete saturation. Chamber B was then completely filled with the gas-saturated oil and after closing the valves at each end, it was disconnected from the balance of the apparatus. The gas was allowed to escape slowly and was measured by the displacement of water. The total volume of gas recovered was the amount that dissolved in 14 cu. in. of oil at the final pressure recorded before disconnecting chamber B. A slight error is here introduced for the volume of oil saturated with gas was a little greater than the volume of unsaturated oil. Therefore the gas recovered from chamber B was contained in some volume of oil slightly less than 14 cu. in.

### Solubility of Natural Gas in Crude Oil

THE amount of natural gas that will dissolve in crude oil depends upon both the character of the gas and the character of the oil, if other conditions are constant. For example, a natural gas consisting mostly of methane is not as soluble as one in which some of the heavier hydrocarbons such as ethane, are present. This is shown graphically by curves 1 and 2, Figure 2. The same oil was used in each case but for curve 1, showing the gas of greatest solubility, the gas contained only 52 per cent methane, while in curve


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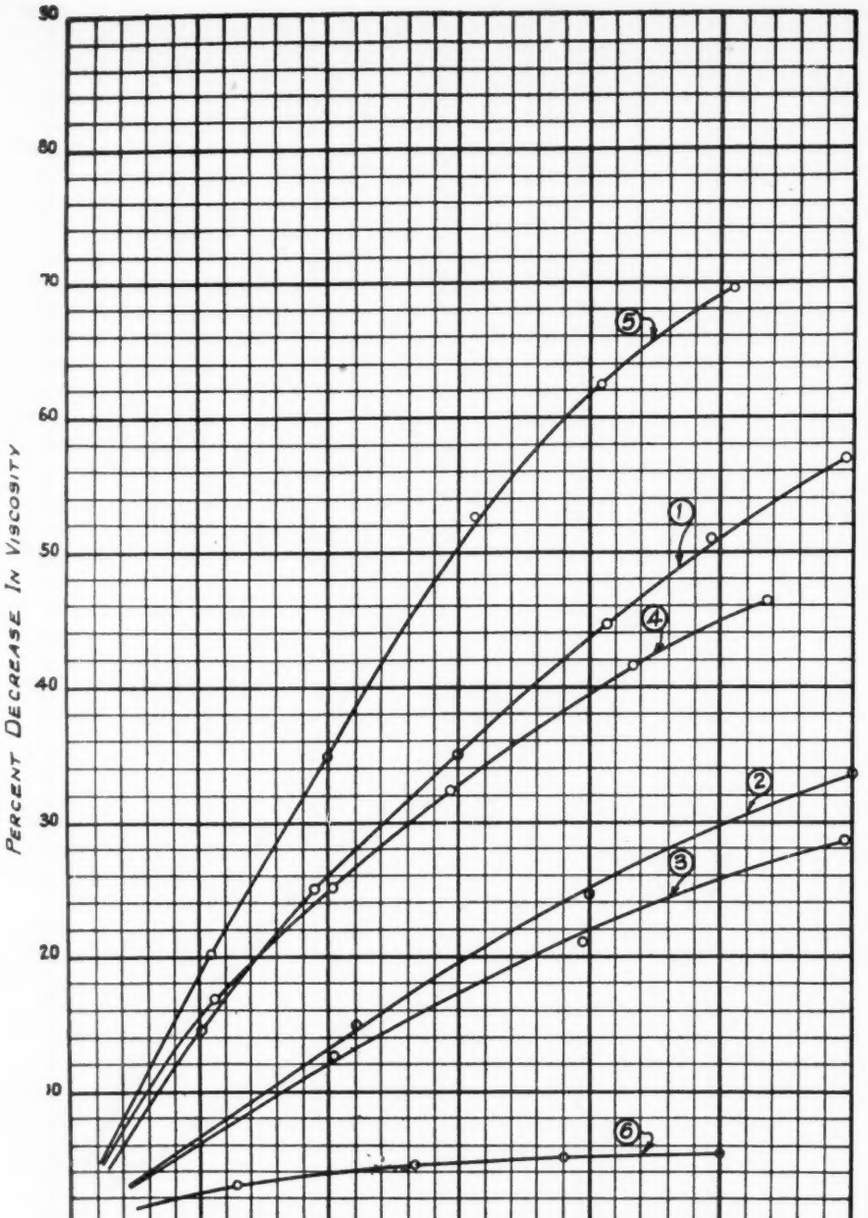



*Figure 4. Decrease in viscosity of crude oils containing gases dissolved under pressure*

| | | | | Analysis of Gases | |
|---|---|---|---|---|---|
| | | | | No. 1 | No. 2 |
| Curve 1. | Natural Gas No. 1 | in Oklahoma Crude Oil. - | 30.2° A.P.I. | | |
| Curve 2. | Natural Gas No. 2 | in Oklahoma Crude Oil. - | 30.2° A.P.I. | $CH_4$ 52.0 | 82.5 |
| Curve 3. | Natural Gas No. 2 | in Oklahoma Crude Oil. - | 35.4° A.P.I. | $C_2H_6$ 39.0 | 5.5 |
| Curve 4. | Natural Gas No. 1 | in Oklahoma Crude Oil. - | 35.4° A.P.I. | $CO_2$ 1.2 | 5.9 |
| Curve 5. | Carbon Dioxide | in Oklahoma Crude Oil. - | 30.2° A.P.I. | $O_2$ 0.4 | 0.3 |
| Curve 6. | Hydrogen | in Oklahoma Crude Oil. - | 30.2° A.P.I. | Res 7.4 | 5.8 |

2, the methane content of the gas was 82.5 per cent.

All analyses of natural gas referred to in this paper were made by the combustion of the gas in an atmosphere of oxygen. The results, therefore, do not represent the true amount of methane and ethane present, but do show whether the light or heavy hydrocarbons tend to predominate.

For any given gas, the volume that will be dissolved depends upon the character of the crude oil, if other conditions are constant. The lighter gravity oils dissolve more gas than the heavier oils. This is illustrated by curves 1 and 3, Figure 2. These curves show a difference in solubility of approximately 20 per cent for the same gas in oils of 35.4 and 30.2° A. P. I. gravities, respectively. As a further example, curves 7 and 8 show a difference of approximately 32 per cent in the solubility of the same gas in two different oils.

### Solubility of Other Gases in Crude Oils

A FEW experiments were conducted to determine the solubility of gases as carbon dioxide, hydrogen and air in crude oils. Carbon dioxide was found to be more soluble than natural gas, while hydrogen and air are only slightly soluble, the hydrogen being less soluble than the air. Curves 4, 5, 6 and 7, in Figure 2, show the relation between the pressure and the volume of gas dissolved in the same crude oil for carbon dioxide, hydrogen, air and a dry natural gas, respectively.

For this particular oil the gas was found to be approximately four times as soluble as air, but only one-third as soluble as carbon dioxide. A similar ratio will probably apply to other crude oils.

Since the experiments referred to in this paper were completed, Dow * and Calkin have conducted a series of experiments to determine the solubility of a practically pure methane gas and of air in various crude and refined oils, The results of their work sustain those given in this paper.

### Rock Pressure and Volume of Dissolved Gas

ROCK pressures of 1000 lbs. per square inch or greater are not uncommon in many oil fields, and at such pressures the volume of gas dissolved in the oil should be at least twice as great as that obtained from the laboratory experiments with pressures around 500 lb. per square inch. Table 1 has been prepared to show the cubic feet of gas dissolved in a barrel of oil at pressures from 300 to 1000 lb. per square inch.

### Effect of Temperature on Solubility of Gas in Oil

OTHER conditions remaining constant, the quantity of gas that will dissolve in oil depends upon the temperature. The relation between pressure and the volume of natural gas dissolved in a crude oil at various temperatures from 50 to 110° F. is shown by the curves in Fig. 3. As the temperature increases the amount of gas that can be dissolved in the oil decreases, but even at the higher temperatures, large quantities of gas will dissolve in the oil. For example, at a pressure of 400 lbs. and a temperature of 90° F., approximately 75 cu. ft. of gas was dissolved in a barrel of oil while at a temperature of 110° F., 70 cu ft. of gas was dissolved in the same oil.

### Solubility of Gas in Crude oil and its Components

NATURAL gas was dissolved in a crude oil and the various major products obtained from this oil including gasoline, kerosene, gas oil and fuel oil. The curves showing the relation between pressure and volume of gas

*D. B. Dow and L. P. Calkin:—Solubility and Effects of Natural Gas and Air in Crude Oil. Reports of Investigations, Bureau of Mines, Serial No. 2732. (1926).

**Table 1. Cubic Feet of Gas Dissolved in a Barrel of Oil at Different Pressures.**

| Gauge Pres. | Okla. Crude 30.2° A.P.I. | | | Okla. Crude 35.4° A.P.I. | | |
|---|---|---|---|---|---|---|
| Lb. Sq. In. | Gas No. 1 | Gas No. 2 | Air | Co. 2 | Gas No. 1 | Gas No. 2 |
| 300 | 57.0 | 46.5 | 12.3 | 161 | 71 | 54 |
| 500 | 95.0 | 77.5 | 20.5 | 276 | 118 | 90 |
| 1000 | 190.0 | 155.0 | 41.0 | 563 | 236 | 180 |

Note: See Figure 2 for analyses of gases.

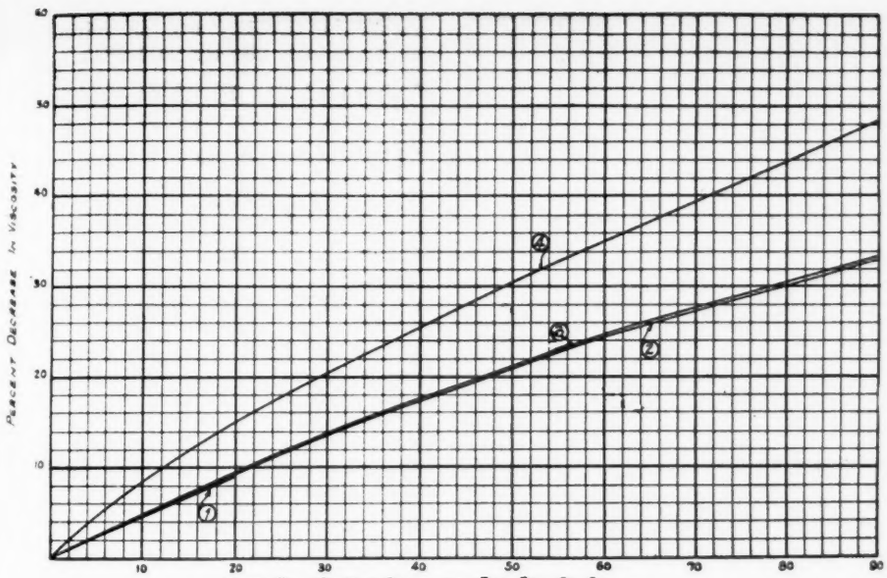



Figure 5. Relation between volume of dissolved gas and decrease in viscosity of crude oil. 30.2° A.P.I. oil temperature 70°F

| | | Analyses of Gases | |
|---|---|---|---|
| Curve 1. | Hydrogen | No. 1 | No. 2 |
| Curve 2. | Carbon Dioxide | $CH_4$ 52.0 | 82.5 |
| Curve 3. | Natural Gas No. 2. | $C_2H_6$ 33.0 | 5.5 |
| Curve 4. | Natural Gas No. 1 | $CO_2$ 1.2 | 5.9 |
| | | $O_2$ 0.4 | 0.3 |
| | | Rest 7.4 | 5.8 |

dissolved are reproduced in Figure 4. Knowing what percentage of the crude each product represented and the volume of gas dissolved in each, it was possible to compute a composite curve. This curve (curve 6, Fig. 4) indicates a greater solubility than for the gas in the crude oil (curve 1, Fig. 4). Several factors may account for this variation. There may be error in the percentage of the total oil represented by each refined product; the volume of gas shown as dissolved in the gasoline is probably a little high because some of the lighter gasoline fractions may have taken place so that the refined products actually differ in composition from the original oil. It is also possible that the solubility of the gas in any one of the products from the crude oil may be changed by the presence of the other products. This experiment again demonstrates that natural gas is more soluble in the lighter oils.

### Apparatus for Determining Viscosity of Crude Oil Containing Dissolved Gas

THE viscosity of crude oil is commonly determined by the Saybolt viscosimeter. This apparatus, however, is not designed to measure viscosity under pressures other than atmospheric; therefore, to determine the viscosity of oils containing dissolved gas under pressure it was necessary to construct a viscosimeter that would operate under high pressures. (Note: Description of apparatus is omitted.—Ed.).

### Effect of Dissolved Gas on Viscosity of Crude Oil

The viscosity of crude oil is greatly reduced when the oil contains gas in

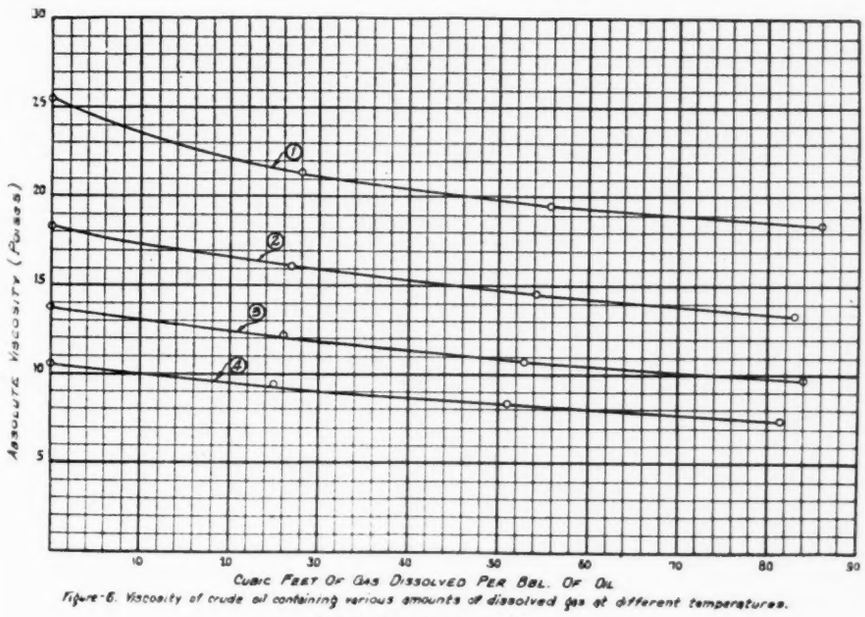
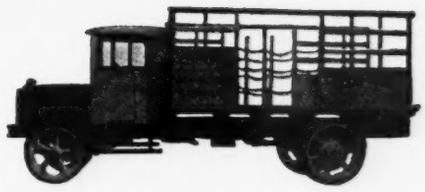



Figure 6. Viscosity of crude oil containing various amounts of dissolved gas at different temperatures.

Curve 1. Temperature 50°F
Curve 2. Temperature - 70°F
Curve 3. Temperature - 90°F
Curve 4. Temperature - 110°F

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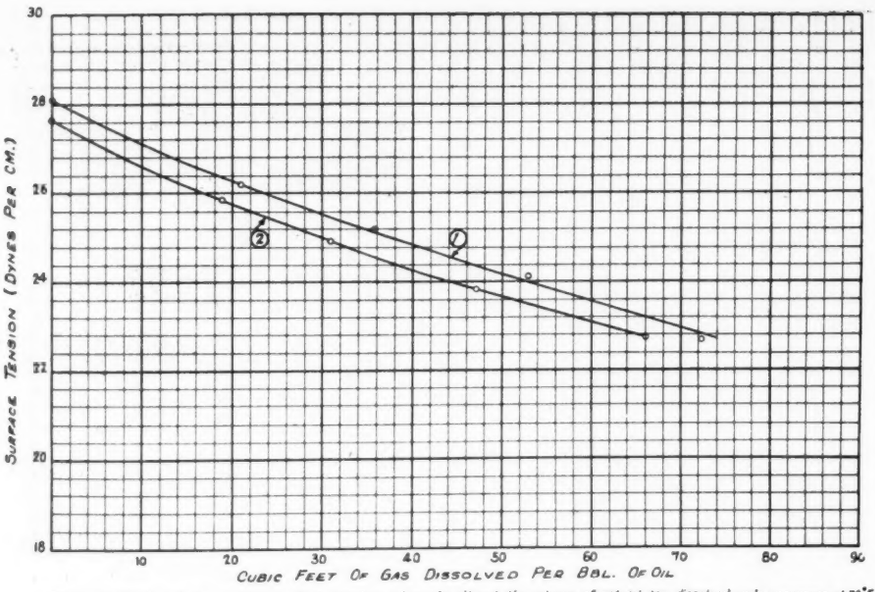


Figure-7. Relation between the surface tension of crude oil and the volume of natural gas dissolved under pressure at 70°F.

Curve 1. Oklahoma Crude Oil. - 35.4° A.P.I.
Curve 2. Oklahoma Crude Oil. - 30.2° A.P.I.

solution. The decrease in viscosity depends upon the amount of gas dissolved in the oil if other conditions are constant. An oil with high initial viscosity will show a greater relative decrease for a given amount of dissolved gas than one with a lower initial viscosity.

Fig. 2 shows the relation between pressure at which various oils were saturated with various gases and the percentage decrease in viscosity of the oil. The viscosity decreases with an increase in pressure because more gas is dissolved at the higher pressure. Curves 1 and 2 are for the same oil but with a different gas in solution; the same is also true of curves 3 and 4. Under the identical conditions, the gas dissolved in the oils as shown by curves 1 and 4 is more soluble than the gas dissolved in the oils for curves 2 and 3, and therefore at the same pressure produced a greater reduction in the viscosity of the oils.

Curves 2 and 3 indicate the reduction in viscosity that resulted when the same gas was dissolved in the different oils. The gas is more soluble in the oil for curve 3 than in the oil for curve 2, but the reduction in viscosity is less. The initial absolute viscosity of the oil for curve 2 is approximately 3½ times greater than that for the oil of curve 3.

Curves 5 and 6 show the reduction in viscosity when carbon dioxide and hydrogen, respectively, are dissolved in the same oil. Carbon dioxide is extremely soluble and therefore produced the greatest reduction in viscosity at a given pressure.

### Effect of Dissolved Air

An effort was made to determine the effect of dissolved air upon the viscosity of an oil. The results were not consistent. In some tests the viscosity was slightly reduced and in others, increased. The increased viscosity may be due to oxidation of the oil when in contact with the air.

Calkin and Dow found that the viscosity of two oils with which they experimented was increased when containing air in solution and in one oil the viscosity was decreased. They attribute the increased viscosity to the oxidizing effect of the air when in contact with the oil under high pressure. It is of interest to note that the two oils showing an increased viscosity had an initial Saybolt viscosity of 550 and 577 sec. at 100° F. while the oil showing a decrease in viscosity had an initial viscosity of only 284 sec. at 100°F.

### Volume of Gas Dissolved versus Percentage Viscosity Reduction

THE curves in Fig. 7 show the relation between volume of gas dissolved and percentage reduction in viscosity for different gases dissolved in the same oil. For curves 1, 2 and 3, hydrogen, carbon dioxide and natural gas consisting largely of methane were dissolved in the oil. These curves nearly coincide. While there is not sufficient data on which to base a conclusion, they may indicate that equal volumes of comparatively pure gases dissolved in an oil will cause equal reductions in viscosity if other conditions are constant. This assumption could not apply to gases such as oxygen which would probably cause an increase in viscosity due to oxidation.

Curve 4 shows the viscosity reduction when a natural gas with a low-methane and a high-ethane content is dissolved in the same oil. For equal volumes of dissolved gas, reduction in viscosity is less for the pure or simple gases.

### Effect of Temperature on Viscosity of Oil Containing Dissolved Gas

As the temperature increases, the viscosity of crude oil decreases and at higher temperatures less gas will be dissolved in the oil, if other conditions are constant. However, the relative decrease in viscosity is approximately the same for an equal volume of a given gas dissolved in the oil at different temperatures. This is illustrated by the curves in Fig. 8, which show the relation between absolute viscosity and volume of gas dissolved at different temperatures. As a further illustration, Table 3 has been prepared from the data shown by curves in Fig. 8, to show the present reduction in viscosity when an equal volume of gas is dissolved in the same oil at different temperatures.

**Table 3—Percentage Reduction in Viscosity for Equal Volumes of Gas Dissolved in the same oil at Different Temperatures.**

| Temperature F | Gas Dissolved per bbl. Oil— 40 | 80 |
|---|---|---|
| 50 | 17.6% | 26.7% |
| 70 | 16.4% | 26.8% |
| 90 | 18.1% | 29.0% |
| 110 | 17.9% | 30.2% |

### Relation Between Viscosity and Flow of Oil Through Sands

VISCOSITY is the most important physical characteristic of crude oil which effects the rate of flow through a pipeline or the small irregular openings of a sand. The quantity of oil that will flow through such openings is inversely proportional to the viscosity, other conditions remaining constant, while the pressure required to produce a given flow varies directly as the viscosity.

A thin fluid of low viscosity such as kerosene will flow through the sands with little resistance compared to that of a viscous crude oil. But, if gas is dissolved in the oil the viscosity will be reduced and the oil will become thinner, approaching the consistency of kerosene

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as the volume of dissolved gas increases. It is estimated that the viscosity of the two oils used in the experiments would be reduced from 40 per cent to 70 per cent when saturated with natural gas at a pressure of 1000 lb., per sq. in. Under these conditions, the oil will be extremely thin and flow through the sands with much less resistance. For example, if the viscosity of the oil should be reduced 50 per cent, twice as much would flow through the sands if other conditions remain constant, or one-half of the pressure would be required to force an equal amount through the sand.

In general, no special effort is made by present production methods, to produce oil with a minimum amount of gas or to retain part of the gas in the sands under pressure such that it will remain in solution with the oil and thus reduce the viscosity and surface tension of the oil. If a larger percentage of oil is to be recovered from the sands more thought must be given to the efficient utilization of the gas dissolved in and associated with the oil.

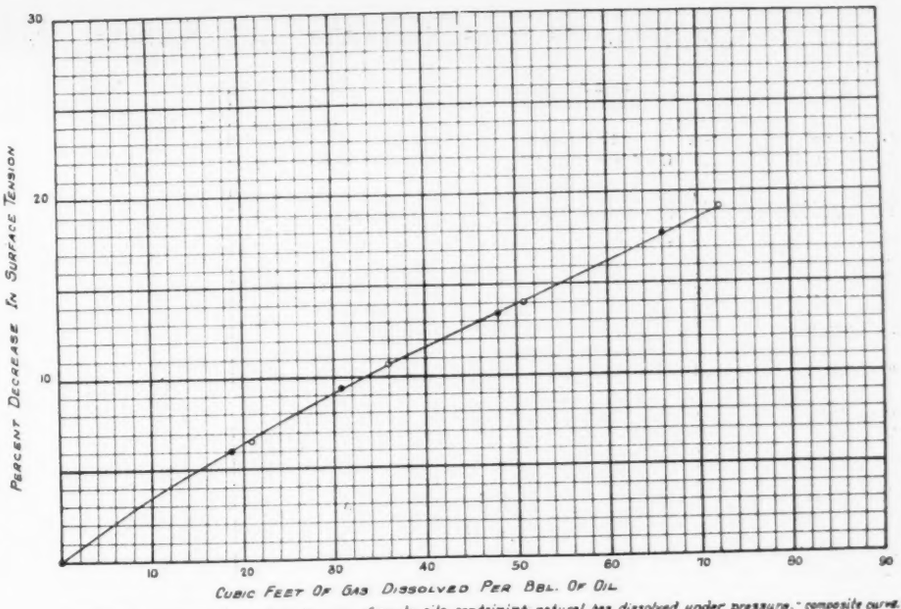


*Figure 8. Decrease in surface tension of crude oils containing natural gas dissolved under pressure. composite curve.*
*○ Oklahoma Crude Oil.- 35.4° A.P.I.*
*● Oklahoma Crude Oil.- 30.2° A.P.I.*

### Relation Between Surface Tension and Recoverable Oil

A LARGE percentage of oil which present production methods fail to remove from the sands is held by capillarity. As the gas dissolved in the oil escapes, the surface tension is increased, and likewise, the capillary force which is a measure of the surface tension. If this increase in surface tension could be prevented during the process of extracting oil from the sands, a greater volume of oil should be recovered.

# Ground is Formally Broken for New Guarantee Factory

ROCHESTER, PA.—Just after a silver horseshoe, suspended from a red, white and blue parachute, dropped from an airplane onto the site, President W. S. Townsend turned the first shovel of earth for the new million dollar plant of the Guarantee Liquid Measure Co. in North Rochester. These formal exercises took place Oct. 4. The airplane was piloted by Col. Harry C. Fry, a vice-president of the company.

Work on grading for the new plant is to start at once and it is expected office buildings will be completed by Feb. 1, and that the new factory, employing about 500 men, will be ready for use by April 1. Rochester will also be the site of the plant for building Marvel, oil and grease pumps, the Guarantee company having purchased the Marvel Equipment Co. of Cleveland in May, 1925.

***Those participating in the exercises of breaking ground for the new plant of the Guarantee Liquid Measure Co. in Rochester, Pa. Left to right, S. R. Grimm, Rochester merchant; Rev. W. A. Atkinson Rochester C. A. Bowden, vice-president in charge of sales. Guarantee company; "Dad" Mac Keage, in charge of employes' welfare; A. J. Towns nd, vice-president in charge of production; Paul R. Engle, assistant general sales manager; John K. Ambose, secretary and treasurer; W. S. Townsend; Former judge G. A. Baldwin, who spoke for Beaver Valley; and H. C. Fry, chairman of the board of directors, Guarantee company.***

Merchants and townspeople of Rochester were present at the exercises, accompanied by their band, and representatives of industrial concerns in the territory. A. J. Townsend, vice-president in charge of manufacturing, and actively in charge of the Marvel plant at Cleveland, was chairman of the program. Former Judge G. A. Baldwin spoke for the citizens of Beaver Valley and S. R. Grimm for those of Rochester. C. A. Bowden, vice-president in charge of sales at both the Fry and Marvel companies, responded to the well wishes of these two speakers.

Henry C. Fry, pioneer manufacturer of Rochester and chairman of the board of directors of the Guarantee Liquid Measure Co., summed up the progress of the company the past decade. President W. S. Townsend told of the aims of the company for the contentment of its workers.

The new plant site comprises 43 acres. The plant proper will have 150,000 square feet of floor space. The office building is to be separate.

President Townsend announces the new factory site will contain many facilities for the recreation of employes.

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LIVERMORE, IA.—Livermore Oil Co. is installing a new 16,000 gallon tank for high test gasoline, reports Edw. Capesius, secretary.

# Completions in Oklahoma and Kansas, Week Ending Oct. 16

## OKLAHOMA

### Atoka County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Hanson et al | 1 | C SE NE 17-4-11E | T.D.4012 | Dry |

### Caddo County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| English | 1 | SW SE NE SW 31-6-9W | T.D.2365 | Dry |
| Magnolia | 6 | SEc NE NE 10-5-9W | 2333-2338 | 30 |

### Carter County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Humble | 3 | NWc SE SE 33-1 3W | 2240-3168 | 445 |
| Schermerhorn | 1 | NWc SW 2-25-3W | 3002-3024 | 96 |
| Humble | 1 | NEc SW NE 3-25-3W | 2552-2675 | 292 |
| Coline | 7 | SEc NE 7-2-2W | 2055-2198 | 5M |
| Magnolia | 3 | NE NW SW 15-2-2W | 1303-1345 | 15 |
| Amerada | 27 | CNL SE NE SE 20-5-1E | 1260-2178 | 148 |

### Comanche County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Magnolia | 2 | SWc 30-2-9W | T.D.3150 | Dry |

### Creek County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Magnolia | 1 | SWc SE SE 9-17-7 | 2713-2828 OWD | 7 |
| Mid-Cont | 3 | SEc SW 15-17-7 | 2874-2890 | 10 |
| Mid-Cont | 27 | NWc SW SE 15-17-7 | 2906-2926 18 & | 8M |
| Tidal | 4 | CWL NE NW 22-17-7 | 2980-2990 OWD | 11 |
| Olean | 7 | SWc NW NE 5-16-8 | 2307-2335 | 15 |
| Gypsy | 15 | SW NW SE NW 1-18-11 | 2089-2091 | 700 |
| Riverland | 3 | SE NE SW NW 1-18-11 | 2099-2103 | 650 |
| Sheridan | 3 | SEc NW NW NW 2-18-11 | 2230-2238 | 30 |
| Wilcox | 2 | SWc NE NE 10-17-9 | 2042-2077 | 100 |
| McCulloch | 1 | CSL SW SE 13-17-10 | 2474-2493 | 25 |
| Lover-Meyers | 1 | NE SE SW 21-16-9 | 2997-3017 | 150 |
| Wilcox-Oswalt | 6 | 5 NE SW 1-16-11 | 2690-2693 OWD | 50 |
| Mannford | 1 | SEc SW SW 3-19-8 | 3145 | Dry |
| McCullough | 1 | SEc 4-18-11 | T.D.2525 | Dry |
| Tibbens | 9 | SEc NE 9-18-12 | T.D.2067 | Dry |
| Gypsy | 37 | NEc SE 7-17-12 | T.D.2563 | Dry |
| Erwin et al | 1 | SWc NE SE 20-16-11 | T.D.2858 | Dry |

### Cotton County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| McBee-Heacock | 1 | NWc NE 21-1-10W | T.D.2427 | Dry |

### Garfield County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Mid-Cont-Marland | 46 | NE NW NE SE 13-22-4 | 3034-3040 | 214 |
| Roxana | 9 | SWc SE SW 18-22-3 | 3615-3632 | 305 |

### Grady County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Gant et al | 1 | NE SE NW NE 19-5-7W | 1966-1974 | 30 |
| Magnolia | 2 | NWc SW SE 27-3 5W | 1671-1685 | 14 |
| Carter | 1 | SWc NW 35 3-5W | 1434-1443 | 41 |

### Hughes County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Roxana | 1 | SWc NE 24-9-10 | T.D.4106 | Dry |

### Jefferson County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Gypsy | 8 | NWc SE NE 33-6-5W | T.D.2045 OWD | Dry |

### Kay County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Comar | 2 | SEc NE SE 20-29-1W | 3325-3370 | 1362 |
| Wentz | 2 | NWc SW 16-29-1E | 3396-3410 | 43 |
| Wentz | 13 | NWc NE SE 28-25-1W | 4233-4268 | 114 |
| Slick | 7 | SWc SE SW 35-25-1W | 3920-4083 | 130 |
| Marland | 1 | NWc SW NW 7-26-1W | T.D.1585 | Dry |

### Muskogee County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Lampton | 1 | C NW SE SW 3-11-20 | T.D.2016 | Dry |

### Okfuskee County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Carter | 2 | SEcSW NE 25-11-11 | T.D.3487 | SM |
| Prairie | 1 | SEc SW 26-11-9 | T.D.3984 | Dry |

### Okmulgee County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Mickelson | 2 | CEL SE SE 4-15-11 | 1908-1925 | 10 |
| Transcont. et al | 2 | SEc 4-15-14 | 1605-1628 | 100 |
| Board | 15 | C E½ NW 23-14-14 | 1048-1057 | 5 |
| Lambert | 1 | CNL SW NE 24-16-14 | T.D.2664 | Dry |
| Radcliff | 1 | NWc SW 33-13-11 | T.D.3904 | Dry |
| Grubbs | 1 | NWc SE 7-15-14 | T.D.2753 | Dry |
| Custer | 8 | NEc SE SE 19-15-14 | T.D.1663 | Dry |

### Osage County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Pet. Drlg | 19 | NWc NE NE NW 25-26-6E | 650- 654 | 1½M |
| Lewis | 4 | NW SE NE 30-25-8 | 2466-2497 | 300 |
| Skelly-Moore | 3 | NW SW SE 35-22-8 | 2390-2403 | 50 |
| Nadle | 10 | SWc NE SW NE 18-22-11 | 1773-1792 | 20 |
| Tidal | 9 | SEc SW SW 15-21-12 | 1219-1243 | 20 |
| Tidal | 4 | NE NW NW 22-21-12 | 1293-1338 | 12 |
| Prairie | 1 | SEc NE 10-27-6 | T.D.3365 | Dry |
| Okla. Natl | 715 | CEL NW 20-21-12 | T.D.1820 | Dry |

### Pawnee County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Sheltz | 3 | NW SW NE 7-20-8 | 2570-2579 | 50 |
| Sinclair | 17 | NWc SW NE 10-20-8 | 2581-2593 | 165 |
| Sinclair | 11 | SW NW NE 10-20-8 | 2583-2605 | 30 |
| Industrial | 1 | SWc NE NE 15-20-9 | 2715-2730 | 30 |
| Prairie | 7 | NEc SE NW 10-20-8 | 2801-2805 | 40 |

### Payne County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Marland et al | 1 | NEc SW 33-20-5 | 3630-3645 | 409 |
| Deep Rock | 4 | SWc SE 23-18-3 | 3700-3768 OWD | 10 |
| Deep Rock | 5 | SWc NW NE 26-18-3 | 4250-4300 | 175 |

### Seminole County—Seminole

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Carter | 1 | SWc NW NE 24-9-6 | 4155-4171 OWD | 1497 |

### Seminole County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Southwestern | 3 | SWc SE NE 18-9-8 | 3295-3319 | 50 |
| Prairie | 3 | SEc 33-10-6 | 4108-4 19 | 1160 |
| Slick | 3 | NEc NW SW 14-8-7E | T.D.3501 | Dry |
| Slick | 4 | NWc NE SW 14-8-7 | T.D.4538 | Dry |
| Dixie | 4 | SWc NE SE 32-8-8 | 4200 | Dry |
| Indep. et al | 2 | SEc NW SE 32-8-8 | T.D.3243 | Dry |
| Indep. et al | 3 | SWc NW SE 32-8-8 | T.D.4210 | Dry |

### Stephens County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Hanbury | 1 | SE SW NW NE 22-1-8W | 2215-2220 | 20 |
| Malernee et al | 2 | C NW SW 20-1-8W | T D.2103 OWD | Dry |
| Safety First | 8 | NW NE SW 20-1-8W | T.D 2050 | Dry |
| Carter | 1 | SWc NW NE 2-2-5W | 1484-1489 | 27 |
| Gypsy | 5 | SEc NE SW 24-1-9W | 2269 2276 OWD | ½M |
| Beard-Cobb | 2 | SEc SW SW SW 31-1-8W | 1988-1997 | 25 |

### Tillman County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Canary et al | 1 | C NW SE 8-4-18W | T.D.2722 | Dry |

### Tulsa County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Superior et al | 1 | NEc NW NW 7-19-10 | 2014-2033 | 160 |
| Commercial | 5 | NWc SE 19-19-11 | 1965-1984 | 85 |
| Texas | 1 | SWc NE 7-16-14 | 1435-1449 | 8M |
| Munn | 2 | SWc 36-19-11 | T.D.2320 | Dry |

### Wagoner County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Mission et al | 1 | SE NE SE 19-16-19 | T.D.1045 | Dry |

## KANSAS

### Butler County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Mid-Kans | 3 | C NE SE NE 22-27-7E | 2710-2726 | 40 |
| Gled | 2 | C NE 28-29-6 | 2245-2255 | 25 |
| Phillips | 2 | C SE SW NW 16-27-6 | 3161 | Dry |

### Chase County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Watchorn | 1 | C NW NW SE 3-18-9E | T.D.2970 | Dry |

### Chautauqua County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Prairie | 7 | NWc SE 8-34-11E | 1375-1422 | 40 |

### Greenwood County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Texas | 3 | C SE NW NE 4-22-12 | T.D.1863 | Dry |
| Theta | 1 | C NW NW NW 31-24-11E | 1840-1867 | 229 |
| Empire | 12 | C NW NE SW 6-22-10 | 2293-2299 | 20 |
| Skelly | 4 | C SE NE NE 15-23-9 | 2290-2352 | 160 |
| Manhattan | 1 | C NW NW NW 17-24-11 | T.D.2110 | Dry |

### Kingman County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Phillips | 1 | C SE 9-27-6W | T.D.4025 | Dry |

### Marion County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Cameron | 1 | SWc 1-22-3E | T.D.2720 | Dry |

### Rice County

| Company | Well No. | Location | Depth | Initial Prod. |
|---|---|---|---|---|
| Phillips | 1 | C SW SE NW 35-20-6 | 3373-3378 | 200 |

# Completions in North Louisiana and Arkansas, Week Ending Oct. 16

## LOUISIANA

### Urania—LaSalle and Winn Parishes

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Nat. Gas & FuelCorp | Urania M-5 | 20-10-2E | 1588 | 25 |
| Catalina Oil Co | Urania No. 2 | 8-10-2E | 1540 | 50 |
| Oil Operators Trust Co. | Urania No. 6 | 7-10-2E | 1522 | 500 |
| Shreveport Oil Corp | Pendaris No. 2 | 26-10-1E | 1516 | 50 |

### Little Creek—Urania—Grant and La Salle Parishes

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| H. L. Hunt | Griswold No. 4 | 2- 9-1E | 1505 | 50 |
| H. L. Hunt | Urania No. 2 | 2- 9-1E | 1510 | 500 |
| Keene & Woolf | Griswold No. 2 | 3- 9-1E | 1508 | 80 |

### Caddo Parish—Caddo District

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Gulf Refining Co | Ferry Lake No. 254 | 22-20-16 | 2275 | 40 |
| Magnolia Pet. Co | Spell No 1 | 29-21-15 | 3553 | junked aband. |
| Texas Oil Co | Curtis No. 1 | 14-20-15 | 2200 | 1500 |

### Bossier Parish—Bellevue

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Gulf Refining Co | Bliss A-10 | 15-19-11 | 420 | 15 |
| Gulf Refining Co | Bliss A-19 | 15-19-11 | 430 | 10 |

### Cotton Valley—Webster Parish

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Humble O. & R. Co | R R Cox No. 2 | 22-21-10 | 4398 | 5m. ft. gas |
| R. W. Morton | Josey No. 1 | 27-12-10 | 4397 | 4m. ft. gas |

### Ouachita Parish

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Central Co., Inc | Kerr No. 2 | 12-19-4E | 2182 | 1m. ft. gas |

## EAST TEXAS

### Panola County

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Magnolia Pet. Co | Ida Tiller No. 3 | | | |
| | E. F. Mitcheson HRS | | 1970 | 2m. ft. gas |

## ARKANSAS

### Bradley County

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Wingfield et al | Southern Labr.Co.No.1 | 2-16-12 | 3008 | dry aband. |

### Smackover

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Gulf Refining Co | Ben Goodwin No. 12 | 32-15-15 | 2380 | 150 |
| Gulf Refining Co | Umstead A-22 | 33-15-15 | 2370 | 100 |
| Standard OilCo. of La | Umstead B-7 | 32-15-15 | 2594 | 90 |
| Texas Oil Co | Neely No. 7 | 27-15-16 | 2255 | 20 |
| Lion O. & R. Co | Hays No 5 | 4-16-15 | 2350 | 100 |
| Ramage et al | Lawton C-6 | 10-16-15 | 2002 | junked aband. |
| Simms Oil Co | Cook No. 12 | 16-16-15 | 2040 | 50 |
| Simms Oil Co | H. O. Murphy No. 1 | 33-16-16 | 2106 | 20 |
| Sunny Jim Oil Co | Plenniken No. 3 | 9-16-15 | 2405 | 15 |

### Lisbon

| Company | Well | Location | Depth | Yield |
|---|---|---|---|---|
| Unity Petroleum Co | Sydnor No. 1 | 21-17-16 | 2140 | 25 |
| Unity Pet. Co | Sydnor No 2 | 21-17-16 | 2160 | 25 |
| Unity Pet Co | Sydnor No. 3 | 21-17-16 | 2150 | 25 |
| Humble O. & R. Co | Sydnor No. 3 | 21-17-16 | 2129 | 25 |
| Imperial O. & G. Co | Goodwin No. 1 | 26-17-16 | 3112 | salt w. aband. |
| Reynolds & Marr | Goodwin No. 4 | 21-17-16 | 2150 | 15 |

# Completions in N. C. & E. Texas, & Panhandle Week Ending Oct. 16

| Company | Well Farm | Location Survey | Depth | Initial Prod. |
|---|---|---|---|---|
| **Anderson County** | | | | |
| Navarro | 5-Greenwood | Mullen | T.D.3503 | Dry |
| **Archer County** | | | | |
| Empire | 3-Parker | SP | 1582–1584 | 60 |
| Empire | 4 | SP | 1575–1576 | 20 |
| Kruger et al | 1-Turberville | Carson | 1489–1522 | 450 |
| Murchison-Fain | 4 | Allison | 1116–1132 | 35 |
| **Brown County** | | | | |
| Kone | 3-Foster | Benson | 1210–1212 | 100 |
| Humble | Kilgore | Delgado | 1172–1188 | 60 |
| Louisiana | 6-Benslow | Curlong | 1266–1279 | 15 |
| Huber | 1-Byrd | Travis | 1324–1340 | 50 |
| Gillman et al | 7-Thompson | Smith | 1235–1245 | 125 |
| Curry Moore | 3-Pickett | | 1267–1285 | 75 |
| Gillespie | 17-Henson | Logan | 1262–1288 | 15 |
| McLester | 10-Wooldridge | ET | 1246–1273 | 180 |
| Curry Moore | 5-Wooldridge | ET | 1228–1260 | 600 |
| Curry Moore | 6-Wooldridge | ET | 1227–1262 | 600 |
| Curry Moore | 7-Wooldridge | ET | 1220–1250 | 600 |
| Midwest | 2-Barbers | Mitchell | 1122–1135 | 5 |
| McLester | 9-Wooldridge | Gaines | 1355 | Dry |
| Lester | 1-Fry | Chaudoin | T.D.1711 | Dry |
| **Callahan County** | | | | |
| Cosden et al | 1-Ramsey | Anderson | T.D.1800 | Dry |
| Willard et al | 1-Snyder | T&NO | T.D. 930 | Dry |
| Canary et al | 1 Guthrith | Victoria | T.D.3050 | Dry |
| Reeves et al | 1-Hall | Carson | T.D 2205 | Dry |
| Wilson | 2-Baum | Comal | 1412–1418 | 10 |
| Slick | 3-Bond | Anderson | 1392–1404 | 35 |
| Cranfill et al | 6-Henderson | Comal | 1392–1404 | 40 |
| **Cooke County** | | | | |
| J. Hoosier | 6-Hyman | Moss | 1196–1240 | 40 |
| Lanier et al | 4-Hyman | Moss | 1182–1198 | 68 |
| Lanier | 5-Hyman | Moss | 1156–1224 | 30 |
| Maer et al | 1-Mitchell | Leftwich | T.D.2503 | Dry |
| Stahl-Lynch | 2-Danglemeyer | Ivey | T.D. 987 | Dry |
| Elliott et al | 1-Bugg | Ruthledge | T.D.1600 | Dry |
| **Coleman County** | | | | |
| Goldrick | 1-Neeb | Comal | T.D.1010 | Dry |
| Curtis et al | 1-Sealey | GH & NR | T.D.3028 | Dry |
| Kirby | 1-Harris | GH&H | T.D.2500 | Dry |
| **Eastland County** | | | | |
| Gulf | 4-Parsons | McLennon | T.D.1565 | Dry |
| Lightfoot et al | 1-Enrest | H&TC | T.D.1632 | Dry |
| Chestnut-Smith | 1-Noble | H&TC | T.D.3345 | Dry |
| Parsons et al | 1-Roberts | McLennon | 3095–3160 | 3M |
| **Gray County—Panhandle** | | | | |
| Magnolia | 1-Merton | I&GN | 2982–3007 | 100 |
| Gulf | 4-Reynolds | I&GN | 2920–2930 | 1740 |
| **Hutchinson County—Panhandle** | | | | |
| Amerada | 5-Whittenburg | CSSD | 2982–3012 | 180 |
| Gibson | 1-Lyall | EL | 2700–2763 | 10 |
| Gulf et al | 2-Whittenburg | H&TC | 2786–2807 | 20 |
| White Eagle | 4-Hedgecoke | SF | T.D.2798 | 180 |
| Gulf | 2-Fee | Hedgecoke | 2935–2980 | 100 |
| Phillips | 7 Whittenburg | H&TC | 2716–2726 | 45 |
| McMan | 2-Gray | | 2919–2957 | 500 |
| McMan | 3-Gray | | 2950–2953 | 1400 |
| McMan | 2-Johnson | A&B | 2915–2935 | 1200 |
| **Hutchinson County** | | | | |
| Phillips | 3-Whittenburg | Williams | 2863–2894 | 600 |
| McMan | 3-Johnson | A&B | 2915–2935 | 3000 |
| Marland | 4-Whittenburg | H&TC | 2871–2908 | 40 |
| Marland | 13-Whittenburg | H&TC | 2975–2999 | 1200 |
| West Tex | 6-Whittenburg | H&TC | 2871–2982 | 250 |
| Canyon | 6-Whittenburg | M&C | 2730–2750 | 4800 |
| Hughes | 4-Kingsland | D'SD | 2705–2782 | 150 |
| Hughes Dev | 5-Kingsland | D&SD | T.D.2768 | 100 |
| McKnight et al | 3-Smith | M&C | 2705–2765 | 500 |
| Mid West Ex | 1-Smith | M&C | 2744–2765 | 3000 |
| Riley et al | 1-Smith | M&C | 2654–2750 | 300 |
| Canadian | 5-Kingsland | M&C | 2854–2866 | 60 |
| Dixon Creek | 20-Smith | M&C | 2902–2945 | 200 |
| Canyon | 1-Whittenburg | M&C | 2763–2819 | 1000 |
| Canyon | 5-Whittenburg | M&C | 2805–2880 | 3500 |
| Globe et al | 1-Whittenburg | M&C | 2765–2830 | 50 |
| Echo | 3-Smith | M&C | 2760–2770 | 1500 |
| Hughes | 16-Kingsland | M&C | 2835–2900 | 150 |
| Japhet | 3-Smith | M&C | 2688–2723 | 300 |
| Lenix et al | 2-Smith | M&C | 2740–2840 | 50 |
| Relief | 3-Smith | M&C | 2667–2712 | 150 |
| Riley-Holmes | 2-Smith | M&C | 2685–2825 | 300 |
| Newby | 2-Cockrell | D&SE | 2976–3035 | 150 |
| **Kaufman County** | | | | |
| Atlantic et al | 1-Hayne | Higden | T.D.3101 | Dry |
| **Limestone County** | | | | |
| Transcontinental | 3-Cochran | Varella | T.D.2822 | Dry |
| Transcontinental | 12-Rosson | Varella | 2831–2836 | 250 |
| Atlantic | 3-Rossen | Varella | 2715–2839 | 275 |
| Godley et al | 3-Rosson | Varela | 2793–2806 | 450 |
| Transcontinental | 6-Rosson | Varela | 2820–2826 | 225 |
| **Montague County** | | | | |
| Texas | 1-Riddle | Votan | 1120–1159 | 240 |
| Farlyn | 4-Maddox | Thompson | 870- 890 | 85 |
| F H & E | 4-Rowland | Chambliss | 1325–1350 | 25 |
| F H & E | 2-Salmon | Zuber | 918- 928 | 12 |
| Humble | 9-Maddox | Thompson | 874- 890 | 80 |
| Pure | 4-Maddox | Thompson | 885- 908 | 70 |
| Texas | 24-Rowland | Chambliss | 1072–1113 | 40 |
| Texas | 21-Rowland | Chambliss | 948- 979 | 85 |
| Texas | 23-Rowland | Chambliss | 1380–1385 | 35 |
| Texas | 20-Rowland | Chambliss | 1059–1120 | 60 |
| Texhoma | 11-Rowland | Chambliss | 1073–1097 | 404 |
| Texhoma | 12-Rowland | Chambliss | 1085–1090 | 27 |
| Humble | 12-Hynds | Wall | 1990–2023 | 5 |
| Texas | 16-Gist | Donohoe | 805- 852 | 40M |
| Consolidated | 1-Force | Shoot | T.D.1308 | Dry |
| Camp | 1-Crawford | Crawford | T.D.2002 | Dry |
| **Shackelford County** | | | | |
| Humble | 10-Cook | ET | 1342–1350 | 65 |
| Humble | 11-Cook | ET | 1357–1366 | 25 |
| Rosier-Pendleton | 1-Cook | ET | 1282–1296 | 500 |
| Rosier-Pendleton | 30-Cook | ET | 1316–1331 | 125 |
| Rosier-Pendleton | 7-Cook | ET | 1192–1204 | 528 |
| Independent | 2-Davis | TP | 1462–1466 | 150 |
| Rosier-Pend | 19-Cook | ET | T.D.1246 | Dry |
| Rosier-Pendleton | 8-Cook | ET | T.D.1223 | Dry |
| **Stephens County** | | | | |
| Phillips | 1-Moon | TEL | 2918–2964 | 1M |
| Phillips | 1-Fred | TEL | T.D.3254 | 15 |
| **Stonewall County** | | | | |
| Ark. Fuel | 1-Craft | H&TC | T.D.4425 | Dry |
| **Throckmorton County** | | | | |
| Cranfill et al | 1-Lee | BBB&C | 1304–1318 | 5½M |
| **Wheeler County** | | | | |
| Texhoma | 1 | H&GN | T.D.2290 | 200 |
| **Wilbarger County** | | | | |
| Humble | 7-Waggoner | H&TC | 1869–1891 | 20 |
| Humble | 8-Waggoner | H&TC | 1885–1888 | 15 |
| Phillips | 10-Waggoner | H&TC | 2302–2306 | 208 |
| Humble | 16-Waggoner | H&TC | 1898–1904 | 30 |
| Milham | 16-Waggoner | H&TC | 2353–2363 | 140 |
| Phillips | 10-Waggoner | H&TC | 2535–2540 | 95 |
| Waggoner | 2-Waggoner | H&TC | 1943–1948 | 40 |
| **Young County** | | | | |
| Atlantic | 10-Rocking | BBB&C | 1154–1168 | 5 |
| Simms | 3-Routon | TEL | 865- 870 | 10 |
| Tex-Unity | 1-Hunt | TEL | T.D.1050 | Dry |
| Humphreys | 1-Griffith | Parkman | T.D.2825 | Dry |
| Atlantic | 1-Keen | TEL | T.D.1006 | Dry |

# Drilling Operations in Oklahoma, Kansas and North Texas

| | Oct. 16 Loc. | Rigs | Drg. | S.D. | Week Total | Ending Oct. 9 Loc. | Rigs | Drg. | S.D. | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **OKLAHOMA** | | | | | | | | | | |
| Burbank | 4 | 5 | 22 | ... | 31 | 5 | 3 | 22 | ... | 30 |
| Other Osage | 12 | 14 | 45 | 12 | 83 | 20 | 13 | 45 | 10 | 89 |
| Bristow-Cushing | 19 | 18 | 133 | 14 | 184 | 15 | 13 | 146 | 13 | 187 |
| North Oklahoma | 10 | 24 | 126 | 70 | 230 | 10 | 25 | 140 | 56 | 231 |
| South Oklahoma | 23 | 24 | 149 | 41 | 237 | 22 | 25 | 169 | 35 | 251 |
| Muskogee | .. | 11 | 65 | 21 | 97 | ... | 11 | 50 | 35 | 96 |
| Okmulgee-Bristow | 10 | 41 | 129 | 31 | 211 | 8 | 41 | 122 | 30 | 201 |
| Tonkawa | 2 | 1 | 14 | 1 | 18 | 2 | 1 | 16 | 1 | 20 |
| Wewoka-Cromwell | 17 | 33 | 265 | 26 | 341 | 15 | 47 | 234 | 43 | 339 |
| Total Oklahoma | 97 | 171 | 807 | 216 | 1432 | 108 | 179 | 944 | 223 | 1434 |
| KANSAS | 65 | 71 | 208 | 216 | 460 | 67 | 74 | 226 | 91 | 460 |
| **NORTH TEXAS** | | | | | | | | | | |
| Eastland County | .. | 3 | 59 | 9 | 71 | ... | 5 | 55 | 11 | 71 |
| Stephens County | .. | 13 | 22 | 12 | 47 | ... | 13 | 18 | 14 | 45 |
| Texas Panhandle | .. | 142 | 373 | 119 | 634 | ... | 134 | 405 | 82 | 621 |
| Mexia District | .. | 3 | 20 | 6 | 29 | ... | 4 | 25 | 8 | 37 |
| E. Texas Wildcats | .. | 2 | 14 | 11 | 27 | ... | 2 | 14 | 12 | 28 |
| W. Texas Wildcats | .. | 173 | 386 | 111 | 670 | ... | 156 | 344 | 109 | 609 |
| Wichita Falls | ¼ .. | 95 | 135 | 65 | 295 | ... | 97 | 142 | 65 | 304 |
| Total N. Texas | .. | 431 | 1009 | 333 | 1773 | ... | 411 | 1003 | 301 | 1715 |
| GRAND TOTAL | 162 | 673 | 2024 | 665 | 3665 | 177 | 664 | 2173 | 615 | 3609 |

## Would Open More Lots

Staff Special

LOS ANGELES CALIF., Oct. 16.—A special election for Nov. 16 has been called in Huntington Beach at which time decision will be reached by the voters whether additional property will be thrown open to drilling. Two propositions will be voted upon. No. 1 is whether the territory between 17th and 12th streets will be thrown open, while No. 2 calls for removal of restrictions from the entire city. Proposition No. 1 would permit drilling on 28 blocks, and adjoins the present active town lot area to the east.

# The Editor's Viewpoint

National Petroleum News

## A Wrong Impression

PART of the general public seems to have the erroneous idea that the supply of petroleum in this country will be exhausted in a few years, based on misstatements in many newspapers concerning the report made a few weeks ago by the Federal Oil Conservation Board.

Careless handling of the news concerning the report by the newspapers is responsible for this false impression that seems to have gotten around, and possibly also the fact that many readers did not correctly register in their minds what the newspapers did say concerning the report.

At any rate, more people than should carry such an idea have written this publication asking if it is true that the supply of oil in this country will be exhausted in six years. Here is the sentence in the oil board's report from which they received this impression, or the newspaper passed the wrong meaning on to the public. "Total present reserves in pumping and flowing wells in proven sands have been estimated at 4½ billion barrels, which is theoretically but six years' supply, though of course it cannot be extracted so quickly."

What the oil board meant to say, and actually did say, if you study the sentence, is that, if we drill no new oil wells, we can expect to take 4½ billion barrels of oil from the wells which are now producing, and that this amount is but a six years' supply.

Obviously as the report sets forth, it would be impossible to take this oil from these wells in six years. Many of them will be producing oil for perhaps 50 years.

New methods will be discovered also for taking more oil from the ground through these present wells than is now anticipated. Just as obviously, also, the industry is going ahead to drill new wells and add to that reserve, just as it has done since the industry started.—V. B. G.

## Reaching the Man in the Field

THE American Petroleum Institute is to carry its message on standardization of oil field equipment, in the broadest sense that term implies, directly to the man in the field, the oil company tool pusher and production superintendent, the drilling contractor and his men.

Having accomplished their task of drawing up standards to govern the manufacture of field equipment, the men both from the oil companies and representatives of manufacturers and supply companies who have carried on the standardization work will now undertake the most logical step of seeing to it that the man who uses the standardized equipment, or superintends its use, has the best information available to get the maximum life and use out of that material.

This move is likely to give great impetus to the study and adoption of improved drilling and production methods generally. There has been a great deal done already along this line, more than the average man who drives through the oil fields has any idea of. The engineering departments of the producing companies, keyed to the need for lifting oil at a smaller cost per barrel, for keeping up production of old properties, and reducing still further waste and loss wherever possible, have worked out real improvements and supervised their installation.

What has been really needed though has been something that would bring home to the field men generally some idea of the strides forward the business of producing oil will take when the field worker generally recognizes it as something of a personal problem.

Now the oil producing industry and the allied manufacturing and supply companies propose, through the standardization committee personnel of the institute, to carry what they have jointly found out regarding the use of drilling and production equipment to the man in the field. They will put in his hands the best ideas that their years of work together have brought out on how the most use and wear can be gotten out of an oil field belt, wire lines and so on.

The chances are it will give him the picture of improving practice and technique which will be a stimulus to his own efforts.—V. B. G.

## Safeguarding the Jobs

HOW far we have gotten away from a government by the people and for the people is to be seen in the fact that collectors and administrators of the gasoline tax laws from all the states are to meet in St. Louis next month to decide what the amount of the tax should be, how collected and what classes of users exempt, among other things.

The millions of men who pay the tax and for whom, in theory, the proceeds of the tax are spent are to have nothing to say in the matter. The theorists on tax matters, those who hold jobs they have created through the gasoline tax, will meet, at the tax payer's expense no doubt, and in a kindly manner explain to him how much he should pay and how.

Perhaps it is just as well, though, that the last man always to be consulted, the tax payer and consumer, should not have a chance to tell what he thinks about the increasing gasoline tax at this meeting. He might chill the atmosphere. Perhaps he will have something to say about the tax, anyhow, when the next legislature in his own state comes to pass on a bill increasing the amount, or amending the present law in some fashion or other, not to meet the particular needs of that state, but because some other state has a law calling for that amount of tax and a certain way of collecting it.

As this publication has said before, the oil inspection departments in the states see a stronger peg to hang their jobs upon in the gasoline tax law than the old kerosene inspection statutes. They are transferring their allegiance to the cause that sets the best table. You will find their representatives at this St. Louis meeting suggesting that, in the states where the tax is paid on receipts and not on actual retail sales, there is danger of the dealer selling naptha or kerosene, on which no tax is paid, to the consumer as motor fuel; or advocating a uniform motor fuel law and again their services to see that uniformity is maintained.

The dear, poor old public. It can be depended upon to pick out by itself the car it wants to drive, and to spend thousands for a home to live in, to buy clothes and diamonds, free of the state's solicitude. In spite of the fact there are several oil companies in every community, it just cannot be depended upon to spend the few dollars it must pay for oil and gasoline at places where it will get its money's worth.—V. B. G.

# Synthesis of Petroleum at Ordinary Pressure from Coal Products

By Franz Fischer and Hans Tropsch

*Translated by W. P. Cutter, Director Information Department Arthur D. Little, Inc., from Brennstoffchemie, 7:97, April 1, 1926*

PART II

AS for the theory of the process, we have been strengthened in the belief which we expressed in our first communication. We must accept the opinion that the first result is the formation of a carbide rich in carbon, which probably contains at least one atom of carbon for each atom of bivalent metal. The carbon is transformed by the hydrogen into the methylene group, which then under the conditions polymerizes and is hydrogenated to a saturated hydrocarbon.

Even without hydrogenation the methylene group can form a saturated hydrocarbon, which then would have a cyclic character. Small amounts of unsaturated hydrocarbons can escape hydrogenation. One thing in the process seems to us established, that the polymerization of the methylene group takes place faster than the hydrogenation working on them. If the latter were the case, the methylene group would be transformed into methane. From this it follows that the hydrogenation in the process must not be too strong, and that on the other hand the catalysing metal must have the ability of forming carbides rich in carbon, properties which according to our observations are especially found combined in cobalt.

Mulheim-Ruhr. Jan. 24, 1926.

## III

In the following we present some additional facts on the operation and the theory of the processes, a few examples and a few other statements on the composition of the resulting products.

### Process Procedure

ON a small scale we worked using glass tubes at temperatures between 250 and 300° C; and then, in order to learn something of the influence of the vessel material on the process, looking forward to the future experimental plant, used tubes of different materials, like iron, copper and aluminum; we have been convinced that the process can be carried out with the same safety in such tubes. We have used for heating the tubes a furnace which had automatic heat regulation, and kept the temperature uniformly constant for the whole length of the catalyst for weeks. The experimental plant had also temperature regulation. On account of the strong influence which the temperature has on the results it is important to keep it uniform throughout the whole length of the catalyst, in order not to destroy at the end of the catalyst layer that which was produced at the beginning.

A flow meter is installed previous to the entrance of the gases into the contact tube, and following directly, a three-way cock, which serves to direct the gas into the reaction tube, to be caught afterwards in a gasometer, or convey the gas direct to the gasometer. If the water escaping from the gasometer is measured in each case, then the contraction in volume is measured, which gives a known point by which the beginning of a contraction of volume can be established. An exact idea of the progress of a reaction is naturally only possible by a complete gas analysis, or, still better for our purposes, a so-called condensation analysis.

### Catalysts.

IN the first experiments, the catalyst or catalyst mixture was used as pure substance without any carrier, in order to be freed from any possible side effect from the carrier. With a tube placed in a horizontal position it was possible to use the catalyst in the form of a fine powder, for example as oxide, formed by careful heating of nitrates. For operations on a larger scale it was necessary to bring it into some form, especially if the tube was placed vertically.

We accomplished this by pressing of the materials with the addition of sulfur-free binding materials. Before it was used as a catalyst, it was reduced in a stream of pure hydrogen at 350° and then water gas was passed over it. In the first period of the catalytic treatment of the water gas, an extraordinarily great contraction of 50 per cent and over was observed, which later decreased. The decrease resulted from the fact that after a time that part of the contraction which was due to the taking up of carbon by the catalyst stopped. If the catalyst has taken up enough carbon, then the amount of contraction remains stationary, for just as much carbon will be found in the exit gas as in the gas at the beginning.

We have already said that the formation of paraffin hydro-carbons higher than methane in no ways is dependent on the admixture of other substances with the catalyst metal, but that the speed of transformation was increased by the addition of zinc oxide, chromium oxide, etc.

Experiments in replacing these difficultly reducible oxides by easily reducible ones, as copper oxide, so that finely divided copper would be present by the side of the carbide-forming metal, proved to us that the formation catalytically of higher hydrocarbons did not depend alone on the presence of oxides. So, in a mixture of iron and cobalt, the difficultly reducible oxide could be replaced by copper, but in mixtures with nickel it could not. The explanation seemed to be that the nickel, a specially good methane builder, but not suitable for the formation of higher hydrocarbons, when alloyed with copper in any proportion, loses its catalytic power. With iron and cobalt, on the other hand, the formation of alloys with copper is very limited. We have noticed a similar refusal to work in the case of a mixture of nickel with another metal, in our work on Synthol.*

A nickel-tin alloy proved wholly unusable in that case. The role of the copper in cobalt and iron catalysts, like that of the difficultly reducible oxides, would seem to be at least in part to prevent the sintering together of the finely divided metal, which would result in a decrease of the active surface. The copper has a special role in the presence of the difficultly reducible oxides, as it has a weak hydrogenation action, in the catalyst mixture, and may act in this manner when the iron and cobalt by continued carbide formation, have lost their hydrogenation action. The favorable influence of the addition of copper can be seen from the following examples.

### Catalytic Action Weak

A CATALYST obtained by the reduction of iron oxide, proved to be only weakly active. We explained this at first by the absence of a carrier substance, and added the iron in the form of nitrate to asbestos. We then heated it to form oxide, and reduced this at 350° C. Water gas was passed at the usual reaction temperature of 270°, with a stream velocity of 5 liters per hour, using a catalyst volume of 30 cc; there was a contraction in volume of 7-8 per cent, proving that the transformation was very slight. The

*Brennstoffchemie. 5:222 (1924).

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formation of a small amount of benzine was shown by the odor of the exit gases. Even on increasing the temperature to 330° C., the transformation was no greater.

A catalyst formed of equal parts of iron and copper behaved very differently. This was also made by making the oxides from the mixed nitrates and reducing with hydrogen at 350°. It was used without a carrier, and gave when water gas was led through, at 270°, a volume contraction of 40 per cent. With this catalyser a large formation of oil and benzine was proven.

### Theory of the Process

AS has been shown by the condensation-analyses of various reaction-gases, these contain hydrocarbons principally of the nature of gas-oil.**

That is, they are hydrocarbons with 3 or 4 carbon atoms, which is extremely remarkable. As we have already shown, with increase in the temperature, the gas-oil disappears. In its place above 400°, only methane is given off. We shall see elsewhere later, that by the addition of special condensation materials it can be brought about that in place of the gas-oil with its hydrocarbons of 3-4 atoms of carbon, higher homologous hydrocarbons are given off, up to paraffin with over 20 carbon atoms. Since the gas-oil is given off at lower temperature than the methane, we can assume that it is the primary product of the process.

When we turn to the older literature which treats of the formation of hydrocarbons by the decomposition of iron carbides by acids, we meet with an investigation by Hahn† and later with another by Campbell†† in 1896 on the interesting fact that propylene and butylene, hydrocarbons with 3 and 4 atoms of carbon, are found among the products from the treatment of carbide-containing iron with acids. Later Schenck, Giesen and Walter‡ in a carefully executed investigation carried on with a large amount of material, proved without question the formation of propylene and butylene by the action of acid on iron containing carbide. It is therefore easy to suspect some relation between the formation of gas-oil by the catalytic reduction and hydrogenation of carbon monoxide and the formation of hydrocarbons by the action of acids on iron carbide, $Fe_3C$. Although up to now no other definite iron carbides have been isolated at low temperatures, we may well assume that they are formed at these temperatures as especially reactive materials during the reaction of catalysis, and disappear again with the

**We take the designation "Gas-oil" from the Engler-Hofer handbook volume 4, page 291. It is used for the liquid obtained by pressure from natural gas containing ethane, propane, and butane, appearing first in America and used in the year 1912. (In the United States, it is called "Natural Gasoline. W. P. C.)

†Liebigs Analen. 129:59 (1864).

††Amer. Chem. Jour. 18:836 (1896).

‡Zeits. f. anorg. Chemie 127:101 (1923).

formation of the gas-oil. Further we must assume that the iron carbide by no means has the simple composition that is indicated by its formula, but that in its molecule three or four carbon atoms are bound together, so that it has perhaps three or four times the above formula, which is quite possible, as nothing is known of the molecular weight of iron carbide, as of most solid compounds. For the primary formation of hydrocarbons with 3 or 4 carbon atoms, we have the circumstance as evidence that working at the lower temperatures with the proper catalyst, we can wholly prevent the formation of methane, only higher hydrocarbons being formed. That the higher hydrocarbons are formed from methane by the action of the methane on the catalyst containing carbon is extremely improbable, since former investigations have shown methane once formed at low temperatures does not go over into other hydrocarbons. It seems to us also improbable now that what we formerly believed (see parts I and II) can be true, that on passing over the carbide a methylene group was formed by the action of the hydrogen, which can polymerize into olefines or napthenes; because we must acknowledge that then a preponderance of ethylene and its hydrogenation product, ethane, would be formed, while the higher hydrocarbons with more carbon atoms would be found in less amount among the reaction products. The last word on this has not been said. The fact remains that propylene and butylene are found to be the principal products of the action of acids on carbides of iron, and that in the catalytic hydrogenation of carbon monoxide with finely divided iron as catalyst at ordinary low temperatures gas-oil is principally formed.

If one desires to speculate on this matter, he may recognize that it is possible that by the carbonizing of fine iron at low temperatures there are formed carbides which have the same relation to each other as exists between the oxides $Fe_3O_4$ and $Fe_2O_3$; these would be the carbides $Fe_3C_4$ and $Fe_2C_3$, which with acids would give dimethylacetylene or monomethylacetylene, and by the action of hydrogen, the corresponding olefines or perhaps butane and propane. With magnesium, besides the normal carbide, yielding acetylene, $MgC_2$, another is known, $Mg_2C_3$, formed by passing carbon monoxide or methane over heated metallic magnesium and on contact with water gives allylene (monomethylacetylene). Whether the ethane recognized by us in the gas-oil is a step in the disintegration of butane or propane into methane, or whether in the carbonized iron carbides having the formula FeO occur, we must leave undetermined.

### Influence of Condensing Substances

WE have investigated whether the addition of condensing substances, namely, certain strong bases and their carbonates, to the catalyst would not bring about the formation of higher


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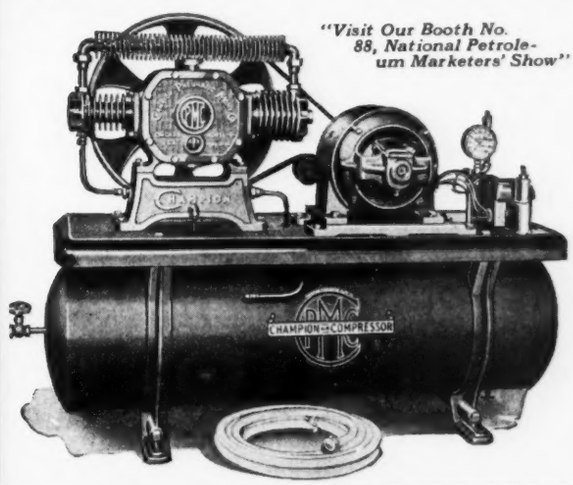


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boiling hydrocarbons than those in the gas-oil. In order to clearly determine this, we used as a catalyst which we had already determined would bring about the production principally of gas-oil, and which would yield practically no benzine. It was that described above, an iron-copper catalyst, with a proportion of 1 : 1 of iron and copper. In these investigations, we profited from the experience which we had gained in the Synthol process on the effect of the basicity of the added hydroxide or carbonate.‡‡

We found that more high-boiling hydrocarbons were produced, as the basicity of the added hydroxide or carbonate increased. The copper-iron catalyst, without additions, as has been said, gave principally gas-oil, and no liquid or solid products; with an addition of 1-2 to 2 per cent of potassium carbonate, on the other hand, high-boiling liquids and paraffin resulted in important amounts. With an addition of the weaker basic sodium carbonate, oil of the character of petroleum was obtained. Catalysts made with addition of barium hydroxide gave a result intermediate between the other catalysts.

### Conservation and Regeneration of the Catalyst

IN all catalytic operations naturally any uniform action for weeks or months can only be expected if there is no poisoning action from sulfur or other poisonous compounds in the gases, and if care is taken to preserve the original active surfaces from gradual sintering together by the addition of the catalyst to carriers.

Paralysis of the catalyst should be mentioned. In a synthesis starting from a gaseous substance containing only one carbon atom, like carbon monoxide, there are formed high-boiling substances with 20 carbon atoms, for example, like solid paraffin, the boiling point of which is higher than the temperature of the reaction. It is not strange that these substances settle in part on the catalyst, and paralyze it.

In such cases either the solid paraffin must be extracted from the catalyst from time to time, or the apparatus be kept under vacuum at the reaction temperature. Regeneration of the catalyst can be brought about by blowing it out with steam, or burning it out with a stream of air. The complete oxidation not only causes the removal of the high-boiling components, but also a higher activity in the catalyst, if it is subsequently reduced by a stream of hydrogen.

### Composition of the Several Products

GAS-OIL. The hydrocarbons in the reaction gases which are only recoverable by pressure we have identified by condensation analysis and determined their amount. Ethane, propane and butane were recognized. The corresponding olefines, ethylene, propylene and butylene were present only in minor amount.

‡‡Fischer & Klopsch. Brennstoffchemie. 5:207 (1924); DRP 411 216.

**Benzine.** The benzine we have separated from the reaction gases from an experimental installation by absorption in activated charcoal and driving it out by steam. The raw product thus obtained was water-white and permanent to light, had a pleasant odor, and after keeping a month showed no yellowing or formation of gum. Specific gravity at 15°C. was 0.6718; calorific value 11 360 calories per gram; point of spontaneous ignition in oxygen 335°C.

The boiling analysis was carried out in an Engler flask. Amount used: 100 cc. First drop 20°C. 40°-2.4; 50°-18.2; 60°-36.8; 70°-51.0; 80°-61.5; 90°-69.3; 100°-75.3; 110°-80.3; 120°-84.5; 130°-87.6; 140°-90.3; 150°-92.3; 160°-94.0; 170°-95.2; 180°-96.4; Residue 1.6%; Loss 2%.

Table 1 shows the boiling points graphically.

Density and ultimate analysis are shown in the following table No. 1.

**Petroleum.** In the experimental plant, in addition to gas-oil and benzine, we obtained a liquid like petroleum, the properties of which we will now describe.

Density at 20/4° 0.7804
Boiling analysis. 25 cc used.
First drop 170°.
180°-4.4; 190°-8.0; 200°-14.4; 210°-20.4; 220°-31.2; 230°-36.0; 240°-42.4; 250°-49.2; 260°-54.8; 270°-59.6; 280°-65.2%; 290°-672.; 300°-70.4; 310°-74.4; 320°-78.0; 330°-83.2%.

Residue 2.53 gm or 12.8% by volume.

The boiling curve is shown in Table 2. The specific gravity and ultimate analysis of the fractions is shown in the following table No. 2.

**Paraffin.** Using an alkaline iron-copper catalyst, we can obtain large amounts of paraffin, whose presence we have noted already when other catalysts were used. The paraffin was separated from the adherent paraffin oil by acetone, it being noted that a portion of the oil was insoluble in the acetone*†. The paraffin, purified by twice crystallizing from acetone, was colorless, without odor, and had a melting point of 61°C. Elementary analysis showed: Carbon 84.57%, Hydrogen 14.57% C:H 99.14% C:H 1:2.05.

*†The same is true of paraffin oils obtained from natural petroleum. The oily parts of the corresponding fractions from lignite tar are, on the other hand, soluble in acetone.

As has been already stated, the synthesis of the benzine hydrocarbons takes place with the most differing mixtures of carbon monoxide and hydrogen. For this reason we are not confined to water gas, but can also use producer gas, coke oven gas, blast furnace gas, as well as mixtures of illuminating gas and blast furnace gas etc., or blast furnace gas to which hydrogen is added. Therefore it is wholly possible to use the greatest variety of coals and cokes as a basic raw material for the synthetic production of petroleum products, for the gases mentioned can be made from these, or, as in the case of coke oven gas, are necessarily made.

On account of its simplicity we have always used water gas in our experiments, for it can be easily made in a generator and is obtained always of the same composition. In the application of the processes it is naturally important to know what amounts of the petroleum hydrocarbons, namely, gas-oil, benzine, petroleum, lubricating oil, and paraffin can be made from 1 cubic meter of the original gas. If we start with water gas, the equation is:

$$3\ CO+3H_2=CO_2+H_2O+2CH_2$$

in the ideal case, in which by $CH_2$ we include any polymer of this, for example benzine. Expressed in figures, the above equation shows that one cubic meter of water gas can furnish about 190 grams of hydrocarbons. In order to approach this in practice, it is necessary to pass the gas several times over the catalyst, and remove the products of the reaction between each passage, until all the carbon monoxide is used up.

In many cases it is more expedient to pass the gas only once over the catalyst, to remove the reaction-products, and lead off the residual gas for its former use. There is the advantage that we have only to take into consideration, as the cost of the hydrocarbons obtained, the portion of the gas that has been used up, and the further advantage that the recovery of the benzine can be made an intermediate step in existing plants. The process can be so

Table 1

| Fraction No. | B. P. limits | Wt. % | S. G. 20-4° | C % | H % | C+H | C:H |
|---|---|---|---|---|---|---|---|
| I | 20– 55° | 26.6 | 0.6367 | 81.23 | 15.60 | 99.83 | 1:2.21 |
| II | 55– 75° | 27.9 | 0.6488 | 84.48 | 15.46 | 99.94 | 1:2.18 |
| III | 75–120° | 28.1 | 0.6838 | 85.04 | 14.98 | 100.02 | 1:2.10 |
| IV | 120–180° | 12.0 | 0.7264 | 83.35 | 14.96 | 98.31 | 1:2.14 |

Fraction III had a calorific value of 11, 495 cal-gm.

Table 2

| Fraction No. | B. P. limits | Wt. % | S. G. 20-4° | C % | H % | C+H | C:H |
|---|---|---|---|---|---|---|---|
| I | 170–270° | 58.4 | 0.7646 | 85.04 | 14.94 | 99.98 | 1:2.09 |
| II | 270–330 | 24.1 | 0.7972 | 85.36 | 14.41 | 99.77 | 1:2.01 |

Fraction I had a calorific value of 11,225 cal-gm.

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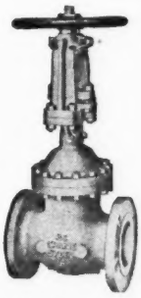

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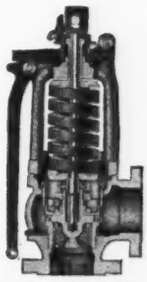

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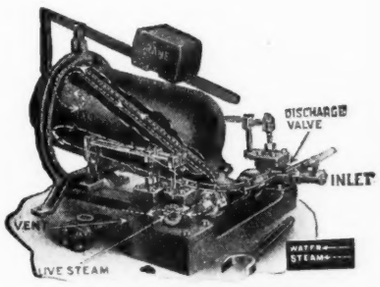
***Globe Valve No. 382-E***

A globe valve to withstand severe service on lines where there is danger of wire drawing. Renewable Nicalloy discs and seat rings. See Circular 185.

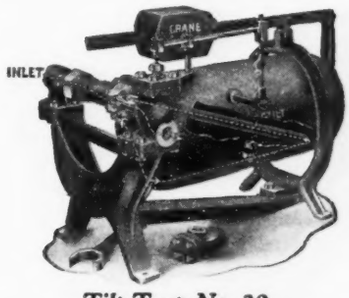



***Tilt Trap No. 100***

Three-valve trap for use as lifting, vacuum or metering trap. Especially adapted to lines of varying pressures. See Circular 164, "Condensation."

***Steam Separator No. 07***

Baffle plate at angle for ready separation. Working pressures up to 125 lbs. Vertical separator of same design also provided. See Catalogue 51, page 232.

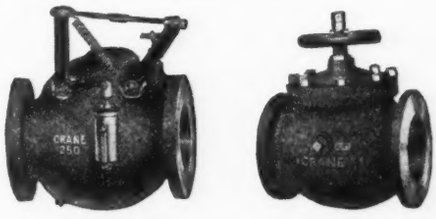



***Tilt Trap No. 30***

Non-return trap. Discharge valve on outside, easily accessible, with an area 50% greater than the area of the inlet pipe. Circular 164, "Condensation."

***Cut-Out Valve No. 36-E***

Automatic double acting non-return and emergency cut-out valve. Extra heavy. Ferrosteel body, Crane hard metal seats and discs. See Circular 51, page 216.




***Relief Valve No. 386-H***

A back pressure and exhaust relief valve. Spring loaded type. Iron body. Brass seat and disc. For back pressures higher than usual. See Catalogue 51, page 244.

Back of these materials stands 71 years of experience.

# CRANE

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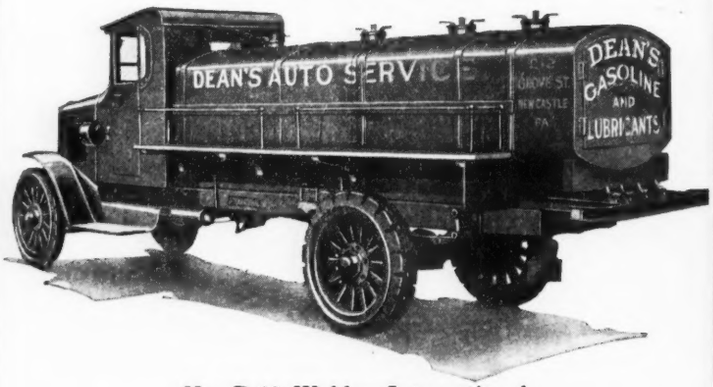
## Fuel Oil Equipment
### For Winter Service




No. R-19 Weldco International
*800 gallon, 4 compartment, semi-rectangular, showing pipe railings and integral can box.*

For fuel oil equipment we recommend our standard tank with a 2 inch rotary pump and a special arrangement of pipes. A 2 inch rotary pump is mounted on the side of the Weldco Tank making it a simple matter to attach it to the power take-off. By means of a special valve the tank may be filled or emptied without stopping the pump. All compartments may be filled at one time or separately as desired. On the opposite side each compartment is piped to the rear so that when not in use for fuel oil the tank can be used for gasoline. The special Weldco funnel drain makes it an easy matter to clean the tank when changing from fuel oil to gasoline.

Write us at once and our engineers will explain without obligation the profit-making possibilities in the Fuel Oil Field. Oil marketers who are awake to new opportunities should investigate this field at once.

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*Welders Since 1912*
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WELDCO TRUCK TANKS
TRADE MARK REG. U.S. PAT. OFF.

"The House of Drum Faucets"

STEEL DRUM ACCESSORIES CORP.
BUFFALO, NEW YORK


carried out that, in addition to the benzine, when water gas is used, we can obtain a great deal of "gas oil" and methane. After the recovery of the benzine and washing out the carbonic acid, a mixture with a heating value of 800 cal/gm will remain, which on account of its great heat value can be transported a distance for use. We can use the excess coke produced by coking plants to manufacture water gas and change this into petroleum products and a gas suited for distance transmission. Large city gas plants can in this manner use their coke to produce water gas, and from this petroleum products and a valuable illuminating gas. So also the coke manufacturing industries can include the process in their low temperature coking plants, using perhaps coal dust, and manufacturing tar and coke, the latter being transformed into water gas and utilized in the same way.

And finally, coming back to the commercial point of view, it would seem necessary in the artificial production of petroleum products that products should be directly obtained which would require no further refining. We have convinced ourselves that, after preliminary purification of the gases, this is possible from the synthesis of carbon monoxide and hydrogen.

## Ads. Say Independent Products Protect

BOYNE CITY, MICH., Oct. 16.—Full-page newspaper space was taken recently by the Indian Trail Oil Co., Mancelona, Mich., which has its purchasing offices here under the name of General Oil Co., to announce the opening of what it calls "one of the largest, most modern and best equipped filling stations north of Grand Rapids." This station is located at Mancelona.

A special three-day offer of two quarts of motor oil free with every purchase of five or more gallons of gasoline, was the opening day attraction.

The company has been operating less than a year and now covers a marketing area of over 200 miles with service stations and dealers. It markets Indian Red Ball gasoline, Red Arrow and Havoline motor oils in Antrim and Kalkaska counties, Mich.

Its dealers are located at Elmira, Kalkaska, Sigma, Lodi, Torch Lake, Alden, Clam River Bridge and Beallaire, in addition to Mancelona, at which point a bulk plant is also maintained, according to L. C. Rouse, manager.

The fact that it is an Independent concern was also displayed conspicuously in the advertisement, which said: "You protect yourself when you use Independent oil. Independent competition is responsible in each and every community for better quality and fairer price on gasoline. For the Independents produce and market gasoline and petroleum products as economically as they can be produced."

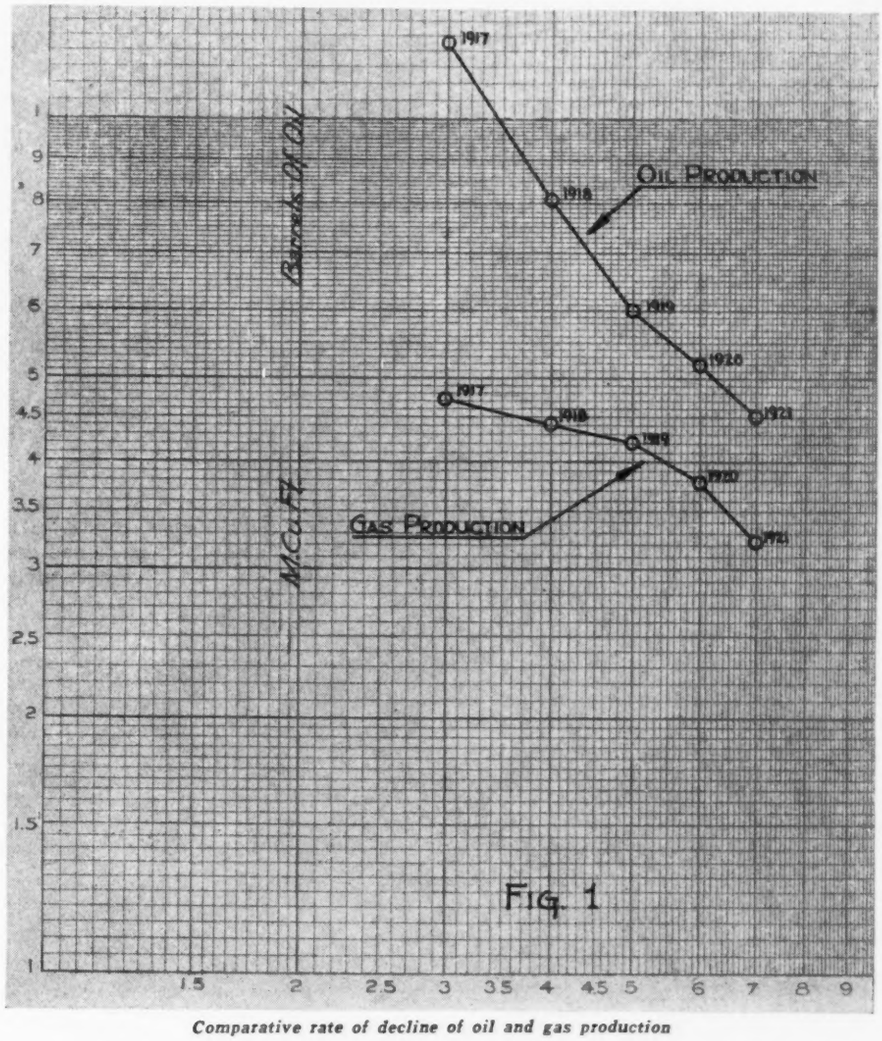
# New Method of Figuring Depreciation And Depletion for Gasoline Plants

By H. E. Rorschach
Valuation Engineer, Naylor, Fitzkee & Rorschach, Accountants and Engineers, Tulsa

WHEN A. Fasenmeyer of Titusville, Pennsylvania and Tompsett Brothers of Tidioute, Pennsylvania, first, in the fall of 1904, produced natural gasoline from the gas produced by oil wells little, if any, attention was given to the question of depreciation and depletion as it affected gasoline plants. In fact, prior to the enactment of the Revenue Acts of 1917 and 1918 the entire oil and gas industry gave little thought to the matter of depreciation and depletion of their properties.

Due to the high tax rates then placed in effect on income, the oil industry turned its attention to the reduction of taxes by every legal means. A great deal of attention was directed towards the reduction of federal income taxes by means of depreciation and depletion deductions on account of revaluation of physical assets or the revaluation of oil in place; this revaluation being occasioned either by a reorganization or on account of the discovery of oil and gas in an hitherto unproven area.

Since the greatest relief was obtained by taking advantage of the depletion and depreciation of oil properties, the industry naturally gave this the major portion of their consideration. The depreciation and depletion of natural gasoline properties was somewhat neglected and forced into the back ground. Furthermore, the natural gasoline industry had not assumed the importance during the early federal revenue tax years, that it has at this time. The growth of the industry since 1911 is shown in the following †table:—




*Comparative rate of decline of oil and gas production*

| Year | Number of Plants Reported | Gallons Produced | Value of Product at Plant Dollars |
|---|---|---|---|
| 1911 | 176 | 7,425,839 | 531,704 |
| 1912 | 250 | 12,081,179 | 1,157,476 |
| 1913 | 341 | 24,060,817 | 2,458,443 |
| 1914 | 386 | 42,652,632 | 3,105,909 |
| 1915 | 414 | 65,364,665 | 5,150,823 |
| 1916 | 596 | 103,492,689 | 14,331,148 |
| 1917 | 886 | 217,884,104 | 40,188,956 |
| 1918 | 1004 | 282,535,000 | 50,363,000 |
| 1919 | 1191 | 351,535,000 | 64,196,000 |
| 1920 | 1154 | 384,743,000 | 71,788,000 |
| 1921 | 1058 | 449,934,000 | 61,815,000 |
| 1922 | 917 | 505,832,000 | 72,711,000 |
| 1923 | Not available | 816,226,000 | 74,000,000 |
| 1924 | 1100 | 933,861,000 | *82,179,768 |
| 1925 | 1143 | *1,200,000,000 | *132,000,000 |

*Estimated.

It is estimated that these 1150 plants represents an investment of $300,000,000 to $400,000,000.

### A Manufacturing Business

THE extraction of gasoline from natural or casinghead gas is essentially a manufacturing business. A majority of the gas compressed in the plants is purchased from leases other than those owned or controlled by the gasoline manufacturers. In any manufacturing enterprise it is quite essential that the cost of production be determined very accurately as competition is quite keen and the margin of profit is usually very narrow, therefore, a successful manufacturer must watch his costs or very soon another will be conducting his business.

The gasoline industry in the past has not been much concerned with manufacturing costs and other expenses. As long as the income exceeded the outgo, a great many gasoline manufacturers concluded that a profit was being made. This conclusion was often erroneous, as a proper allowance was not being made for the exhaustion of the raw material, nor was the allowance, if any, for depreciation of plant and equipment computed on a scientific basis. The industry being so new and with such little past experience available, it was slow in arriving at a proper method for the calculation of depletion and depreciation.

In the *"Manual For The Oil & Gas Industry" it was suggested that a rate of 8 per cent to 13 per cent, with an allowance of 20 per cent for salvage, be used in depreciating gasoline plants, the useful life being placed at six to 10

*"Treasury Department Bureau of Internal Revenue."

years. Those rates took little, if any, account of the gas right value which in many instances was very important and which often exceeded that of the physical assets.

In the past some companies have depleted the value of the gas rights or gas contracts on the basis of the estimated recoverable gas. This method leads to inaccuracies as it is a well known fact that the decrease in the gas volume is not proportional to the decrease in gallons of gasoline produced; in some instances the gallons of gasoline produced by a plant may actually increase over a period without additional leases being connected to the plant. This is shown by the following data taken from some representative plants:

### Oklahoma Plant

| Month | Gas Treated M. Cu. Ft. | Net Production (Gallons) |
|---|---|---|
| July | 35,576 | 240,000 |
| August | 33,700 | 238,000 |
| September | 32,023 | 229,900 |
| October | 30,676 | 254,848 |
| November | 29,491 | 252,621 |
| December | 29,693 | 266,821 |
| January | 29,816 | 268,577 |
| February | 24,509 | 229,627 |
| March | 27,692 | 314,218 |
| April | 27,479 | 287,619 |
| May | 27,731 | 259,031 |
| June | 27,302 | 269,060 |

### Burkburnett Plant

| Year | Gas Treated M. Cu. Ft. | Net Production (Gallons) | G.P.M. |
|---|---|---|---|
| 1918 | 63,259 | 43,437 | .68 |
| 1919 | 97,772 | 291,709 | 3.00 |
| 1920 | 91,349 | 435,573 | 4.80 |
| 1921 | 111,582 | 583,070 | 5.22 |
| 1922 | 122,430 | 686,795 | 5.60 |
| 1923 | 79,775 | 575,409 | 7.21 |

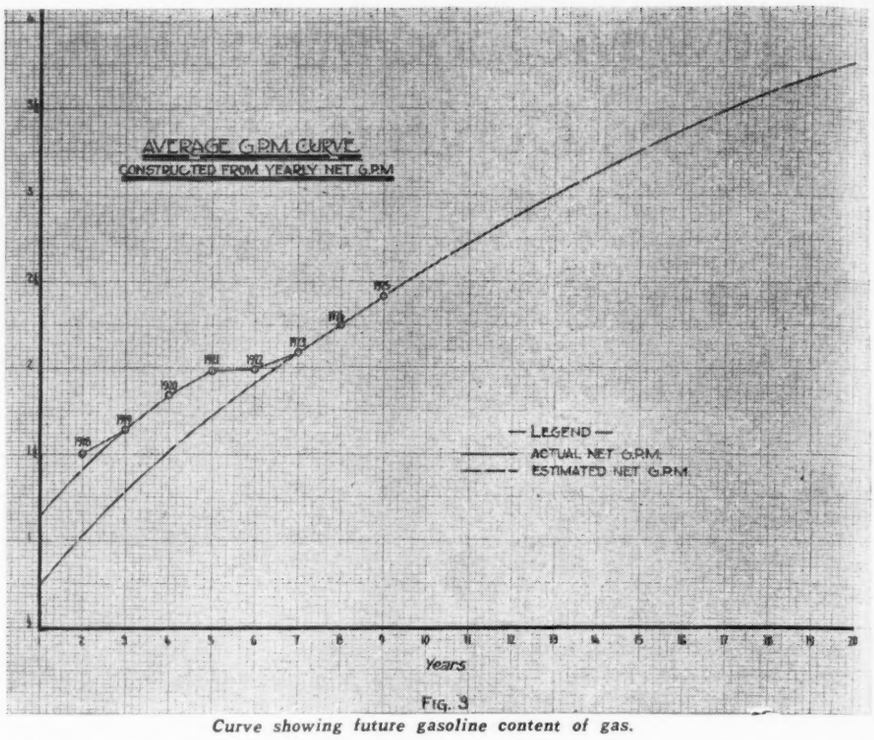



FIG. 3

*Curve showing future gasoline content of gas.*

With the shortcomings of the old methods in mind, several of the major gasoline producers sought to devise a method of computing depletion and depreciation which would more accurately allocate these costs to each gallon of gasoline produced.

In connection with this work, the writer devised a method of arriving at the reserves to be recovered from gasoline plants where data pertaining to the past performance of the plant is available. This method is submitted herewith in detail.

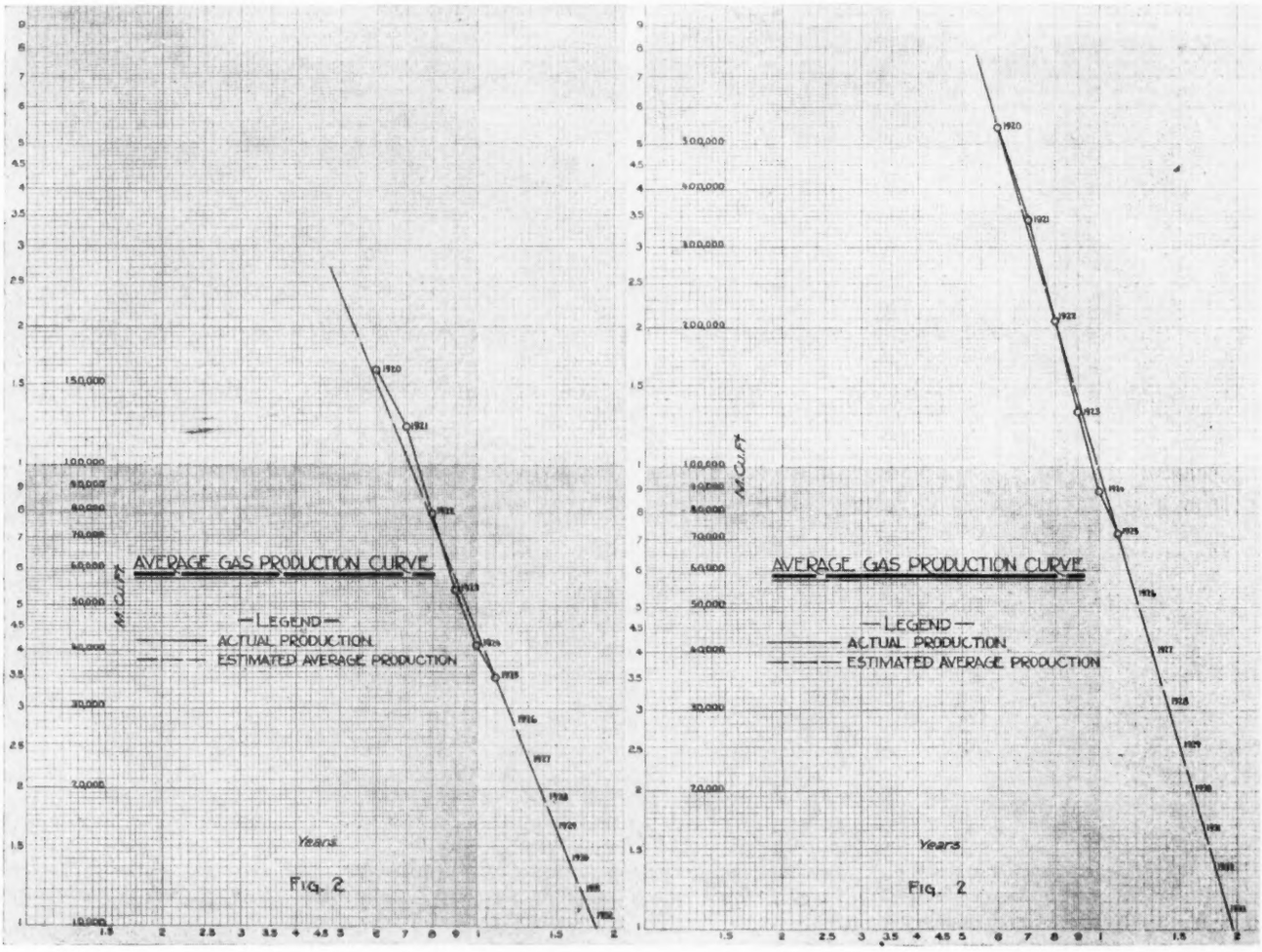



FIG. 2 FIG. 2

*Representative gas decline curves.*

# WORLD LEADERSHIP

Since the Tretolite Process (the chemical process) for treating "cut oil" was perfected by William S. Barnickel, in 1913-1916, it has become the world's leading method for treating petroleum emulsions.

Hundreds of millions of dollars worth of oil have been reclaimed by its use.

It has saved hundreds of valuable wells from total loss.

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It has saved more oil for the large producers than has any other discovery of recent years.

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In so important a matter as the selection of the correct method for treating your emulsions, do not act without full knowledge of the facts. Let us send our nearest field expert to explain to you fully the Tretolite Process. No obligation.

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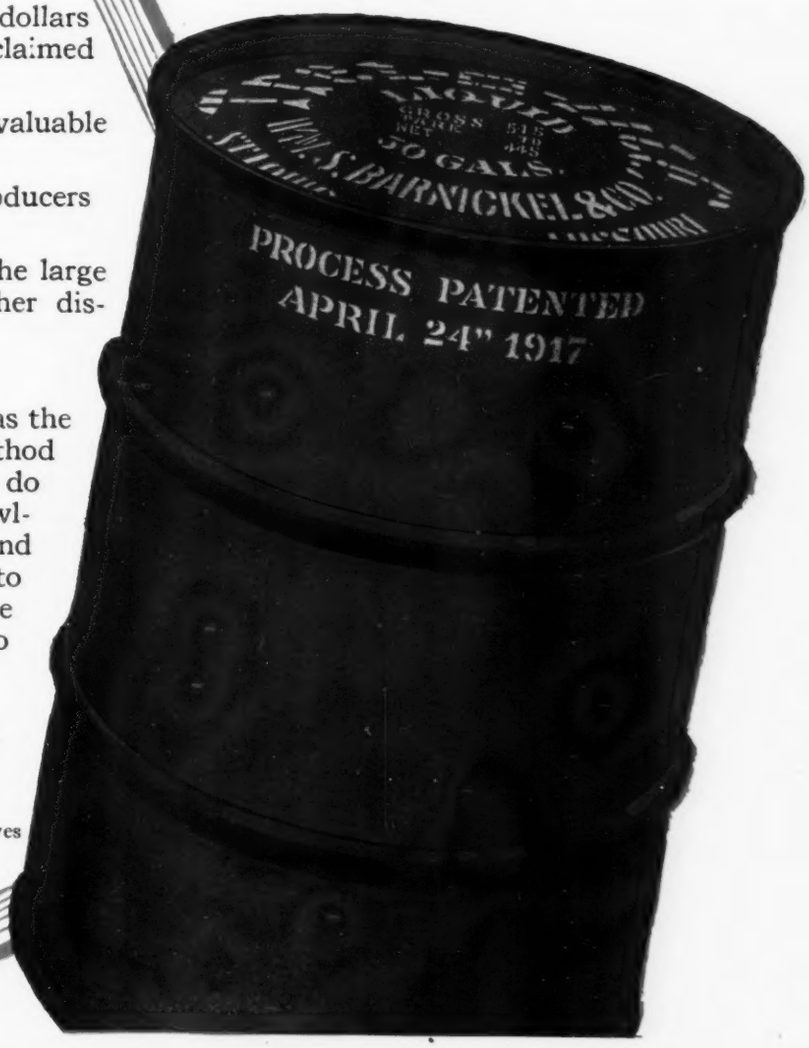


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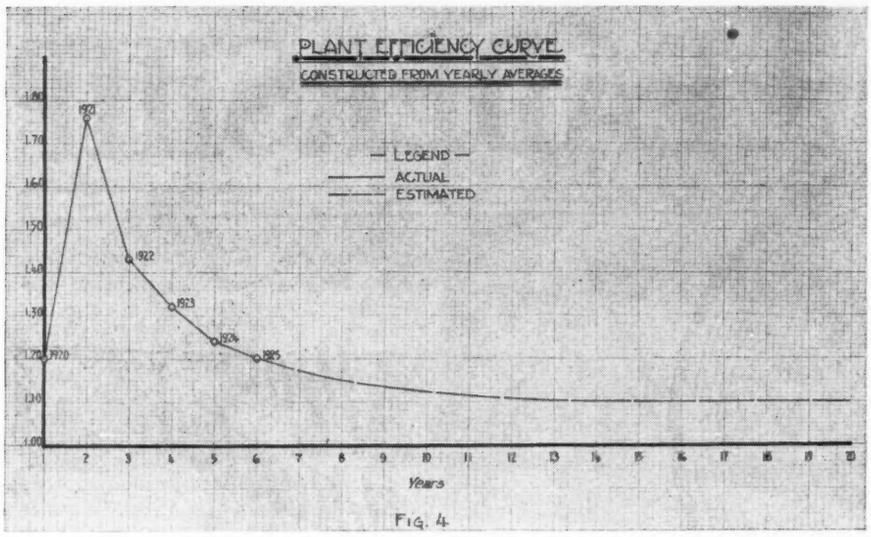


Fig. 4

A study of a large number of gasoline plants was made and from this it was found that the decline in the gas supplying these plants did not decrease in direct ratio with the decline of the oil produced from the properties from which gas was being withdrawn. This is very clearly set out in a representative curve shown in Fig. 1. The data below taken from a study of 30 leases clearly indicates the lack of direct relation between the oil produced and the amount of gasoline produced.

### Study of 30 Leases

| | Gas Produced Per Barrel of Oil M. Cu. Ft. | Gasoline Produced Per Barrel of Oil Gallons |
|---|---|---|
| 1st Year | 1.23 | 2.00 |
| 2nd Year | 1.74 | 2.38 |
| 3rd Year | 1.95 | 3.13 |

### One Individual Lease of the 30 Leases

| | Gas Produced Per Barrel of Oil M. Cu. Ft. | Gasoline Produced Per Barrel of Oil Gallons |
|---|---|---|
| 1st Year | 2.82 | 4.14 |
| 2nd Year | 8.29 | 12.30 |
| 3rd Year | 6.97 | 16.99 |

### Curve for Each Property

IT was decided that a decline curve should be made for each property supplying gas to the various plants, and from each curve the future production in cubic feet of gas be determined. In the investigation that followed some representative decline curves were obtained, some of these are shown at Fig. 2.

It is a well known fact that the G.P.M. or gasoline content of gas produced from oil wells increases as the wells grow older. This is the result of the decrease in rock pressure which causes some of the heavier hydrocarbons contained in the reservoir rock to vaporize and come out of the well as a gas. A study of a number of properties from which gas was being taken lead to the conclusion that the future gasoline content of gas could be predicted with a fair degree of accuracy. A representative curve, indicating this increase in G.P.M. is shown at Fig. 3. With these factors determined it then became a matter of simple computation to determine the amount of gasoline to be produced by each lease under contract. This computation is made as shown below:—

### (Fig. 6) Cushing Plant Depreciation Schedule

| Depreciation of Plant | 1920 | 1921 |
|---|---|---|
| Estimated reserves, at beginning of yr. (Gals.). | 12,895,602 | 11,309,377 |
| Production for yr. (Gals.). | 1,586,225 | 3,165,995 |
| *Plant investment at beginning of year | $261,210.32 | $229,081.33 |
| Unit Cost | $ .020255 | $ .020255 |
| Depreciation sustained | $ 32,128.99 | $ 64,127.23 |

*Less estimated amount for salvage value of physical equipment at time operations will cease to be profitable.

leases delivering gas to a plant was made, it was necessary that a plant efficiency factor be computed, as a new and modern gasoline plant will usually extract more gallons of gasoline per 1000 cubic feet than will be shown by a compression test made with a small test car.

### Plant Efficiency Increases

FROM a study of a number of plants it was found that the plant efficiency factor gradually increases the first few years of plant operation, then declines over the latter years of the life of the plant. This is explained by the decreasing efficiency through the aging of the machinery and equipment and the pipe line in which the gas is taken into the plant by vacuum, permitting air to be taken into the line with the gas. From this study it was not possible to get an efficiency curve that was entirely satisfactory, however, a curve representing some values worked up relative to the computation of efficiency factors is shown at Fig. 4.

By using the efficiency factors, determined for each year, in conjunction with the lease summary an estimated amount of gasoline to be produced was obtained for the plant. This result gave a reserve which is used in determining the depletion and depreciation unit for the plant. A depreciation schedule for a gasoline plant is shown at Fig. 6.

(Continued on page 96)

### SMITHSON LEASE CONTRACT NO. 2
### ULTIMATE RECOVERABLE GASOLINE

| Year | Recovered Gas (Cu. Ft.) | Future Recoverable Gas (M. Cu. Ft.) | G. P. M. Per Test | Ultimate Potential Production (Gallons) |
|---|---|---|---|---|
| 1920 | 540,000 | | 1.50 | 810,000 |
| 1921 | 345,000 | | 1.60 | 552,000 |
| 1922 | 205,000 | | 2.00 | 410,000 |
| 1923 | 132,000 | | 2.05 | 270,600 |
| 1924 | 89,000 | | 2.25 | 200,250 |
| 1925 | 72,000 | | 2.50 | 180,000 |
| 1926 | | 53,000 | 2.60 | 137,800 |
| 1927 | | 40,000 | 2.75 | 110,000 |
| 1928 | | 31,000 | 3.00 | 93,000 |
| 1929 | | 25,000 | 3.15 | 78,750 |
| Totals | 1,383,000 | 149,000 | | 2,842,400 |
| Total Ultimate Production Recoverable under terms of Contract (Gallons) | | | | 2,842,400 |

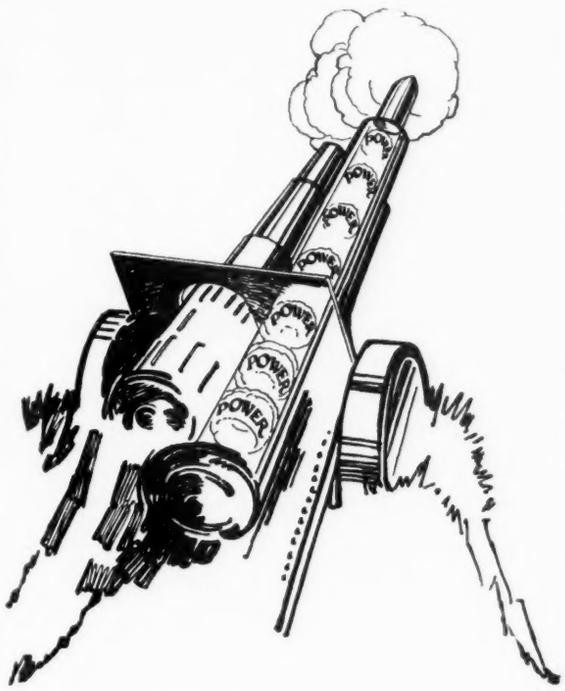
By summarizing the estimated recovery from the leases from which gas was being withdrawn, the estimated gasoline production of a plant was determined. This is clearly shown in Fig. 5. After the summarization of the

### SUMMARY OF ULTIMATE RECOVERABLE GASOLINE CUSHING, GASOLINE PLANT (OKLAHOMA) (Fig. 5)

| Contract No. | Description | County | Potential Production (Gallons) Recovered 1920 | 1921 | 1922 | 1923 | 1924 | Future Recoverable 1925 | 1926 | 1927 | 1928 | 1929 | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N½ Sect. 1, Twp. 8N, Rg. 8E | Seminole | 50,210 | 138,276 | 141,004 | 132,957 | 92,792 | 86,000 | 82,320 | 78,975 | 72,964 | 68,289 | 943,787 |
| 2 | S½ Sect. 1, Twp. 8N, Rg. 8E | Seminole | 810,000 | 552,000 | 410,000 | 270,600 | 200,250 | 180,000 | 137,800 | 110,000 | 93,000 | 78,750 | 2,842,400 |
| 3 | NE¼ Sec. 2, Twp. 8N, Rg. 7E | Seminole | 176,343 | 409,166 | 411,658 | 365,032 | 226,597 | 194,126 | 122,690 | 81,500 | 57,420 | 41,730 | 2,086,262 |
| 4 | NE¼—SE¼ Sect. 36, Twp. 8N, Rg. 6E | Seminole | 40,372 | 140,626 | 138,150 | 130,188 | 93,639 | 71,200 | 50,604 | 35,506 | 27,114 | 22,460 | 749,859 |
| 5 | S½—SW¼ Sec. 10, Twp. 6N, Rg. 8E | Seminole | 126,188 | 307,870 | 296,800 | 256,502 | 215,971 | 176,570 | 125,644 | 98,850 | 80,700 | 66,800 | 1,751,195 |
| 6 | NE¼ Sect. 24, Twp. 9N, Rg. 6E | Seminole | 118,740 | 250,920 | 216,612 | 170,950 | 106,780 | 88,200 | 65,460 | 56,750 | 45,300 | 34,126 | 1,153,838 |
| | Total Potential Production | | 1,321,853 | 1,798,858 | 1,614,224 | 1,326,229 | 935,329 | 796,096 | 584,518 | 461,581 | 376,498 | 312,155 | 9,527,341 |
| | Total Plant Production | | 1,586,225 | 3,165,995 | 2,308,340 | 1,750,626 | 1,159,810 | | | | | | |
| | Efficiency factor | | 1.20 | 1.76 | 1.43 | 1.32 | 1.24 | | | | | | |
| | Estimated future efficiency factor | | | | | | | 1.20 | 1.16 | 1.14 | 1.12 | 1.10 | |
| | Estimated future plant production | | | | | | | 955,315 | 678,040 | 526,202 | 421,678 | 343,371 | |
| | Total Ultimate Recoverable Gasoline | | 1,586,225 | 3,165,995 | 2,308,340 | 1,750,626 | 1,159,810 | 955,315 | 678,040 | 526,202 | 421,678 | 343,371 | 12,895,602 |

# MORE POWER

## *All* the Way Through




And now for an even better Kanotex Motor Fuel—one that combines all the high qualities of other fuels, yet gives an increase of 15% to 20% more power—the new

KANOTEX KANT-NOX GASOLINE

Like the new slow burning gun-powder, that delivers an even impulse during the entire travel of the projectile through the gun barrel, this new gasoline forces the piston all the way through the cylinder and overcomes the knocking effect—yet sacrifices none of the good qualities found in straight run gasoline. Exhaustive road tests have proven it the most perfect motor fuel obtainable.

## 11 Points of Excellence

1. **GREATER POWER.**
The slow burning qualities of the hydro-carbons found in Kanotex Kant-nox Gasoline deliver a constantly increasing power impulse during the entire downward stroke of the piston.

2. **FASTER PICK-UP.**
The light and heavy ends of Kanotex Kant-nox Gasoline are combined in proper proportion—neither is sacrificed for the other. This gives the power necessary for a faster pick-up.

3. **QUICKER STARTING.**
With the lighter ends rightly balanced, Kanotex Kant-nox Gasoline has the much desired quick starting properties often sacrificed for power in straight-run fuels.

4. **ANTI-KNOCK PROPERTIES.**
The high proportion of natural benzol and similar hydro-carbons in this new motor fuel—not found in other fuels—overcome the knocking effect of the paraffins.

5. **LESS CARBON.**
Quick combustion of paraffins deposits carbon in the cylinder. The slow combustion of Kanotex Kant-nox Gasoline lessens the carbon deposits and helps to keep the cylinders clean.

6. **NO DOPE.**
Knocking can be decreased by adding certain harmful dopes. Nothing is added to Kanotex Kant-nox Gasoline to in any way change its value as a fuel. The coloring matter is neutral.

7. **GREATER MILEAGE.**
The even stroke of the piston, the slow but complete combustion of the gasoline, and the greater power give more miles to the gallon.

8. **CLEAN BURNING.**
Every component part of Kanotex Kant-nox Gasoline is a fuel that is completely burned, forming an even chain of combustion and leaving no residue.

9. **UNIFORMITY.**
Every distillation must come up to the requirements of our formula for Kanotex Kant-nox Gasoline. This assures an even, uniform quality all the time.

10. **STRAIGHTER DISTILLATION CURVE.**
There is an even balance between the lighter ends that give ease in starting, and the heavy ends that mean power. This is the result of a straighter distillation curve than is found in straight run gasolines.

11. **GUARANTEE.**
Kanotex Kant-nox Gasoline is sold with the positive assurance that we are back of it. If after the use of a full tank, any user is not more than satisfied, his money may be refunded. The Kanotex Refining Company will make it good.

## Sold Through Legitimate Jobbers Only—To the Best Retail Trade

KANOTEX

**Write, Wire or Phone for full Details to**

# The Kanotex Refining Co.

**L. D. 4** **Arkansas City, Kansas**

# Study Method of Using Distilled Water From Stills For Boiler Feed

By Paul Truesdell
N. P. N. Staff Writer

CLEVELAND, Oct. 16

ONE of the next changes in refinery operating practice that bids fair to be made in the Western Pennsylvania plants, where many improvements have been accomplished in the past year or two, is in the method of handling boiler feed water. It is an improvement that will cost the refiner almost nothing to put in operation, and will save him a good many thousand dollars a year.

It will consist in finding the cheapest and most efficient way of returning to the boilers, as feed water, the condensate of the steam used in the stills and the exhaust steam from pumps and other steam driven units. However, in the Pennsylvania plants, the refuse of the steam from process work is a much more important factor than exhaust steam from the pumps.

Of all the steam generated in the average Pennsylvania refinery boiler plant about 60 per cent goes into the stills and only 40 per cent for power purposes. This is according to the estimate of Herbert A. Ross, mechanical engineer employed by H. S. Bell to carry out the program of improving boiler house practice that has been going on for more than six months, having been decided upon as a cooperative enterprise by the National Petroleum Association.

It is the general practice to trap out the condensed steam from the running lines just before the lines enter the tailhouse, and in most plants it is run into the sewer. At some of the plants, the condensed steam runs with the distillate stream through the tailhouse and into the tank and is drawn off from the bottom.

### Wasting Distilled Water

AT any rate, the condensed steam is thrown away. Yet that condensed steam is distilled water of great purity which would prevent scaling of the boiler tubes and the consequent expense of cleaning tubes and shut down time.

While throwing away this distilled water, the refiners generally are drawing their boiler feed water from their condenser boxes, because it is hot and thus saves some fuel that would otherwise be needed to bring it up to boiling temperature.

The quality of the condenser water is bad in most cases. It is usually pumped from a river or creek which is much polluted by dirt of various sorts and it usually has a high content of mineral salts. It is placed in the open condenser boxes where it evaporates at a rapid rate due to heat and exposure to the air. This evaporation increases the concentration of mineral salts and then the water is pumped into the boilers.

The result is that the boilers have to be cleaned out frequently to get rid of scale or else they operate at low efficiency, due to the fact the water in the tubes is insulated by scale deposits from the heat of the fire. In either case, it costs the refiner money.

G. P. Brockway, president of the Seneca Oil Works, Warren, Pa., has five boilers. Rapid formation of scale has made it necessary for him to shut down one boiler a week for cleaning. That throws an undue load on the remaining boilers and sometimes it is difficult to keep steam up to the required pressure. The experience of most of the other Pennsylvania refiners is similar. The expense of these frequent cleanings is heavy.

Rapid scaling up of the boiler tubes until recently was about the only harmful effect from the use of the raw condenser box water for boiler feed, although that was enough. But now other evil effects are being felt at some plants. At one in particular cited by Mr. Ross, it has been difficult to get enough steam into the lubricating oil stills through steam lines and the spiders in the still bottoms.

### Lack of Steam Spoils Batch

MORE than one batch of oil has been spoiled or at least reduced in value because of the cracking which occurred on account of an insufficient quantity of steam. At one plant the problem became so serious that Mr. Ross began to study the problem. One half turn, or "two spokes" turn of the inlet valve, which had been the measure for years of the amount of steam going into the still, failed to admit enough. Even if the valve was opened wide, they couldn't get enough. Mr. Ross put a manometer on the line leading into the still and it showed the pressure was away down. The line was opened and found to be largely plugged up with salt deposits. The perforations of the spider in the still were also plugged by mineral incrustations.

The reason, according to Mr. Ross, was the forcing of the boilers to get higher efficiency. Steam cannot carry solids and under normal operation the steam did not carry over enough entrained water to make any appreciable trouble in the steam lines in the stills. However, when the boilers were crowded, it caused high ebullition and the carrying over into the steam lines of large quantities of entrained water.

This entrained water contained enough solids so that their deposition in the lines choked off the flow of steam to such an extent that the quality of the products was injured.

The subject of recovering the condensate of the process steam and the power steam for boiler feed water is being studied now by Mr. Bell's engineering organization and by the refiners themselves. There are three questions that stand out prominently.

1. If all the process and power steam used in the plant were recovered and fed back into the boilers, how near would it come to fulfilling the plants' requirements for boiler feed water?

2. Is there any acid or oil in the condensed steam that would have an injurious effect on the boilers or on the steam lines?

3. What is the best way to transfer the condensed distilled water from the point where it is trapped out of the distillate running lines to the boilers?

As to the first question, of course, theoretically, if all the steam used in process and power work were condensed, it would be equal in volume to the original feed water from which it was generated and hence the same water could be used over and over continually. Actually, however, of course, nothing like 100 per cent recovery could be realized and it is a question how much the loss would be.

### May Recover 75 Per Cent

AT a guess it seems likely that at least 50 per cent or perhaps as much as 75 per cent could be recovered for boiler feed water. It might be that in the case of some pumps or other units using steam, which operate only intermittently, the cost of recovering the exhaust steam would be greater than it was worth.

However, if only 50 per cent of the total feed water requirements could be obtained by recovering the steam, the scaling of

**Condensate for Feed Water**

Getting a constant supply of good boiler feed water is a problem with many refining plants.

Western Pennsylvania refiners, through their valuable cooperative engineering program, are carrying on experimental work now to determine how far they can go in condensing the steam used in the stills and the exhaust steam from pumps for pure distilled feed water to reduce scaling of the tubes and lines.

The accompanying article discusses the three principal questions that come up in a consideration of this change in practice.

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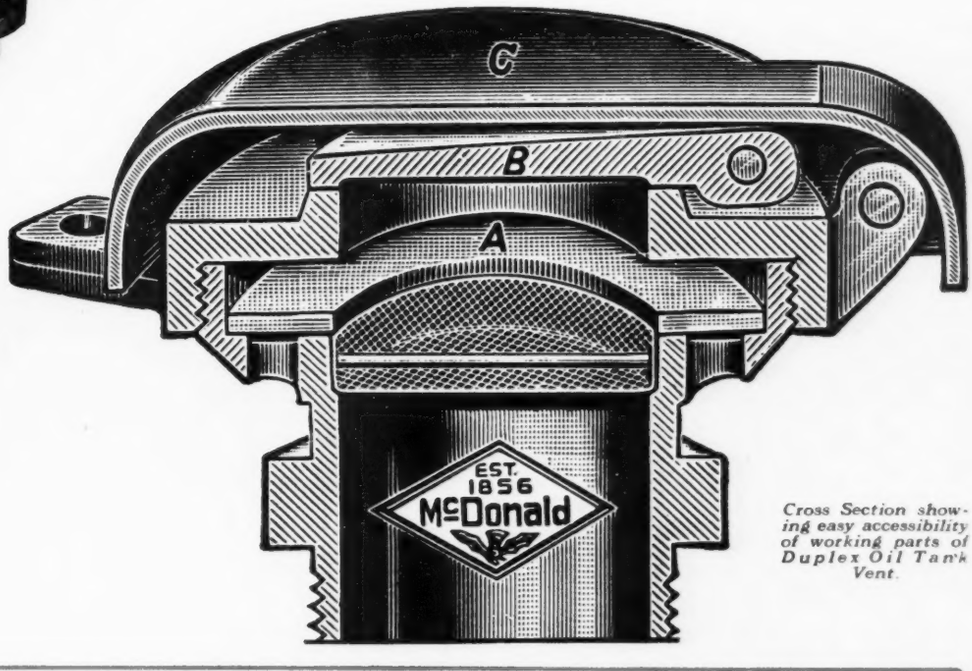
*Duplex Tank Wagon Vent. Plate 840. Patented 12-3-1912*

*Simplex Tank Wagon Vent. Plate 839. Patented 12-3-1912*

*Combined Tank Wagon Cap and Vent. Plate 837 Patented 6-19-1923*

*Duplex Oil Vent.—Plate 834. Patented 1-3-1911*




*Cross Section showing easy accessibility of working parts of Duplex Oil Tank Vent.*

# McDONALD

the boilers would then be only 50 per cent as great, it is pointed out, and the shut down of boilers for cleaning would be only half as frequent and the clogging of the steam lines only half as rapid as if all the feed water were taken from the condensers.

As to the second question. The condensed steam from various stills and various other pieces of equipment is being tested now to see whether it contains acid or other injurious material. Mr. Brockway is one refiner who is much interested in the possibilities of recovering and re-using his condensed steam and he furnished samples of the distilled water from his plant which Mr. Ross is now having analyzed. It is not expected that any trouble will be found from this source, however.

The best method of transferring the water from the running lines back to the boilers is also being considered. One way that has been thought of is to remove it by means of a simple trap and lead it through an insulated line to an insulated tank where the condensate would be collected from all parts of the plant and whence it would be fed to the boilers by means of a pump. If the gathering lines and tank were insulated, little loss of heat would be expected.

Attaching a combination of pump and trap to the running lines to pump the water directly into the boiler feed water heater has also been suggested. Little difficulty will be met with in handling this problem, it is believed, provided the plan proves feasible otherwise. Some refiners believe that considerable heat will be lost in returning the distilled water to the boilers, so that it will enter the tubes considerably cooler than the water from the condenser boxes does at present.

Mr. Ross, however, believes that on an average the distilled water from the running line would reach the boiler at somewhere around 180 to 200 F., which is not far from the temperature of the water in the condenser boxes. The temperature of the streams would vary considerably, of course, from the different running lines, the water coming off with a lubricating distillate stream being considerably hotter than that off a light oil stream.

As an example of what may be done in recovering the distilled water, one plant recently installed an insulated tank into which the condensate from the pumps and a preheater is discharged. The cost of this installation was very small. The water is collected in the tank and pumped to the boilers at a predetermined rate by a small, motor-driven centrifugal pump.

The superintendent of this refinery estimates the condensate collected is about one third of the total volume of the boiler feed water required and he figures that, when the system is extended to take in also the condensate of the process steam, the boilers can be fed altogether on distilled water and troubles from scaling practically eliminated.

Considerable work is also going on at the Pennsylvania refineries toward improvement in the use of steam in process work. Superheaters are being placed in the still flues at some plants to bring the steam to a higher temperature so that it does not cool off the still and delay the distillation process.

Also work is being done by Ross and Bell toward recovering and re-using the steam once used in the still, catching the steam as it leaves the still, before it condenses, boosting its pressure and returning it to the still.

# New Head of Union Tank Car Co. Is Market Division Product

*Lauren J. Drake, president of the Union Tank Car Co.*

LAUREN J. DRAKE, who became president of the Union Tank Car Co. last month upon the retirement of E. C. Sicardi, is a product of the marketing division of the oil industry.

Mr. Drake was born in 1880 in Keokuk, Iowa, a descendent of English immigrants. He attended Omaha and Chicago public schools and Shattuck Military school at Faribault, Minn., from which he was graduated in 1900. Thenceforth he worked for several oil companies acquiring a general knowledge of the industry and its business but specializing in the distribution division.

In 1905 he entered the employ of the Galena Signal Oil Co. representing it in the middle west until 1916 when he was called to New York to be vice-president and a director of the company.

Mr. Drake was elected president of Galena Signal in 1920 and served in that office until last month when he resigned to pilot the tank car company.

Mr. Drake married Miss Edith Love in 1903. They have three children: Mrs. Richard Lamberton of Franklin, Pa., Mary Anthony Drake and Julia Campbell Drake of New York. Mr. Drake is a member of the New York Yacht Club, New York Club, and the North Hempstead Country Club, Long Island.

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# CINCINNATI GLOBES

## Sell Oil and Gasoline

# Offers $1 Cash Prize to Finder Of Neglected Grease Cup

HUNTSVILLE, ALA.

JAMES F. WATTS (Jimmie) owner and personal supervisor of a service station in Huntsville does a lively greasing business in a small and almost hidden space behind his establishment on a wooden grease rack and here is how he does it:

Jimmie openly offers a cash prize of $1 to any customer who can find a grease cup overlooked on his machine after the greasing job is pronounced finished. A sign on the wall advertises the proposition.

On two occasions Jimmie has gone into his flank pocket and fetched out a big round silver dollar, such as are still preferred specie in this section of country, and passed it out with a grin to somebody who discovered a dry grease cup after the job was supposed to be finished. The rule at the station is to grease a Ford for 75 cents or any other car for $1. So the offer to the public amounts to a guarantee. Customers get a perfect greasing job or their money back. Ford owners, much less likely to find a dry cup, are offered a two-bit premium.

The assurance behind Mr. Watts' guarantee is Tom Gordon, Jimmie admits. Mr. Gordon is the oldest employe of the establishment in point of service. He had many years of experience in a mechanical repair shop before he began to grease cars for a living, so there are few types of motors which he has not taken down, piece by piece. When a new car or a new model comes on the market, Mr. Gordon is unhappy until he has learned all of its new features.

Ordinarily two men work on a greasing job together. If one of the men is a new employe Mr. Gordon works with him. Mr. Gordon operates the grease gun and the new man the connection to the grease cups, placing it each time at the older man's instruction. In this way each new man is taught the work, and incidentally impressed with the importance of being thorough. Seven men work at the station, including Mr. Watts, and every one of them takes a hand in the greasing when it is necessary. The establishment is open night and day.

"I would bet any reasonable amount that we can grease a Rolls-Royce here and never miss a single point where grease should be applied," Mr. Watts said, "and I never saw a Rolls-Royce car in my life. When we are the least bit in doubt about our familiarity with a machine we use this manual."

The book which Mr. Watts exhibited was about the size of an academic dictionary—called the Alemite Manual. It is published under the supervision of the Bassick Manufacturing Co., Chicago, and contains the greasing specifications of every automobile in the world, and every model of each one for 10 or 15 years back. There is no probability of any automobile being found in service which may not be greased perfectly by following the instructions in that book.

"Not long ago the first new-model Buick to be sold in Huntsville came here to be greased. Mr. Gordon took this manual, opened it to the place, laid it open on the fender of the car and checked off the friction points as they were greased. This information is furnished the publishers by the manufacturers of the different cars, supposedly. There is no necessity for any greaser to leave a single cup dry if he is willing to take pains with his job."

Besides offering the dollar prize for a dry cup on any greasing job, Mr. Watts' men always make it a point to invite each customer to stand by and watch the greasing done. Whether the motorist does this or not, the invitation tends to assure him that the workmen mean to do the job well. And in addition to this, Jimmie Watts was brought up in Huntsville, a cotton marketing and milling center in north Alabama just big enough to have streetcars. Everybody in town knows him—allowing a small margin for newcomers.

A motorist's every requirement for his car can be supplied at the Watts Service station except mechanical repair. The establishment gives road service, does tire repair work, operates a battery station, sells repairs and accessories and oil and gasoline. The business has an approximate turnover of $10,000 a month, of which about 2 per cent is petroleum business. Recently, because it fitted in neatly with the battery business, Mr. Watts took on a radio agency as a side line.

The motor oil business in Huntsville, at Watts' station as well as others has two peaks a month. On the 2nd, 3rd and 4th of each month and again on the 16th, 17th and 18th, a distinct increase in motor oil business is observed. This is due mainly to two things. Mr. Watts advises his customers to have their oil changed every month, because he believes the average car around Huntsville does about 500 miles a month and thinks a man can watch a calendar with less effort than a speedometer. Most of the habits of mankind are synchronized on a basis of time, and Jimmie Watts has tried to make the matter of changing motor oil a habit.

It so happens that the two biggest industries in Huntsville pay their employes on the first and 15th of each month. The spending habits of these employes are timed with pay-day of course, and now after years of it the merchants and business men of the city have gotten into the same habit. Bills are due on the first and 15th at stores and shops. Bank deposits mount up on those days. And in the same way Mr. Watts has trained his trade to change their oil about the same time. Not only does this protect the customers' cars and increase motor oil business but it goes a long way toward eliminating the credit nuisance. People who change oil on pay-day are more likely to pay cash.

# Western Refining Co. Building Big Station System

Staff Special

TULSA, Oct. 11.

MID-CONTINENT Petroleum Corp. (Cosden & Co.) is building a distributing system to market part of its production direct to the consumer. Stations are being bought and built at a rapid rate, largely in the marketing territory of the Standard Oil Co. of Indiana.

At the beginning of this year the Mid-Continent owned only five stations. Since that time it has built approximately 60 stations and purchased about 135. Its present chain consists of 200 stations in Missouri, Iowa, Indiana, Illinois and Kentucky.

The Mid-Continent is one of the last large Independent refiners to acquire its own distributing system. During the past few years refiners in the Mid-Continent field have been seeking to assure themselves of a definite, steady outlet for their goods through service stations. A check of the field this week indicates that out of 130 active plants 55 have distributing outlets and 75 have not. The 55 plants with station connections, however, have a total still capacity of 640,000 barrels a day while the 75 without stations have a combined crude capacity of only 228,500 barrels a day.

### Change In Policy Expected

WHEN J. S. Cosden resigned as president of Cosden & Co. and Jacob France became head of the company it was expected there would be a change in the marketing policy of the company. For a long time the company had sold a large part of its output to the Standard Oil Co. of Indiana. When its contract with the Standard expired the company began to sell to jobbers on contracts, first on a margin under the tank wagon and later on a modified market date of shipment agreement.

Determining the best method by which to market its large production has been one of the major problems which the new management of the company has had to face. The West Tulsa refinery is the

*Rupert Cox, who sold his business, the Central Oil Co., St. Joseph, Mo., to Mid-Continent Petroleum Corp.*

largest in the Mid-Continent field with a crude capacity of 35,000 barrels a day. Runs for the last year have been maintained on a steady basis of 25,000 barrels a day and production of gasoline is now more than 200,000,000 gallons a year. In addition the plant makes large quantities of lubricating oils.

Observation of the new management of the company has been that consistent profits can be assured only if a company is engaged in all branches of the business. During the last two years the Mid-Continent's main profit has come as a producer and not as a refiner. Crude prices have been uniformly high and gasoline prices relatively low as compared with retail markets. A much larger profit could have been earned if a fair sized part of the finished gasoline had been sold through the company's own stations.

### Plan to Have 600 Stations

IT is the present plan of the company to acquire enough stations to move about half of the refinery's production of gasoline. This would amount to about 10,000,000 gallons a month and would require a system of upwards of 600 stations.

Negotiations are being conducted by the company for the properties of two large distributing companies in the middle-west. One of these with some 40 stations is now under option and announcement of its purchase is expected before the end of October.

Indiana stations of the Lily Cil Co., Vincennes, were recently bought. Other recent purchases include the Independent Oil Co., Paris, Ky., with a group of stations in adjacent territory, three Independent stations at Terre Haute, Ind., and the Central Oil Co., St. Joseph, Mo.

Headquarters of the distributing division of the company are to be in St. Louis. These offices will be combined with whole-

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"The House of Drum Faucets"

STEEL DRUM ACCESSORIES CORP.

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sale sales and traffic offices. Office space has not been leased.

T. W. Martin has been placed in charge of the distributing division. He has been with the company for 30 months. Previously he was engaged in sales work in another industry.

Gasoline and motor oils are both sold under the name of Diamond products. A special anti-knock gasoline is sold under the name of Nevr-Nox.

* * *

### Cox Sells Jobbing Company

ST. JOSEPH, Mo., Oct. 11

RUPERT COX, proprietor of the Central Oil Company, St. Joseph, has sold his business to the Mid-Continent Petroleum Corp., Tulsa, as of Oct. 1. In addition to the large bulk station at St. Joseph, the Central operates bulk stations at these places: Excelsior Springs, Mexico, Marceline, Rosendale and Cameron Henrietta, Mo., and Wathena, Kan. In these towns the company has 17 service stations. It has agencies in 50 other towns.

Mr. Cox engaged in the oil business by buying a small enterprise at Excelsior Springs. A few months later the business of the Central Oil & Gasoline Co. at St. Joseph was acquired. He had operated as Rupert Cox Equipment Co., handling a large line of refinery and marketing equipment in the Southwest.

Mr. Cox built his oil business up to 2,500,000 gallons of gasoline and kerosene a year.

Mr. Cox will pass a month's vacation touring the East.

## Figuring Depletion of Gasoline Plant

(Continued from page 88)

It is believed that the results obtained by this method are superior to the results obtained by some of the older methods in use by some of the gasoline producers at this time.

The advantages of this method might be briefly summarized as follows: the proper amount of depletion and depreciation is attached to each unit produced or manufactured, which in this case is a gallon of gasoline; each gallon of gasoline bears its proportionate part of depletion and depreciation charges resulting in the greatest deduction during the period of greatest production and greatest income; the producer has the estimated future production of his property constantly before him; and the depreciation and depletion is easily computed, after the reserves have been obtained, as it is only necessary to multiply the gallons produced or manufactured for the period by the unit cost, the result being the depletion or depreciation sustained.

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# Discuss Cracking Possibilities and the Gasoline of the Future

CLEVELAND, Oct. 18

DR. ROY CROSS co-inventor of the Cross cracking process and Dr. Gustav Egloff, chemist of the Universal Oil Products Co. (Dubbs) at the recent Four-State jobbers' meeting in Kansas City, discussed the motor fuel of the future from different standpoints. Dr. Cross centered his talk on giving figures showing results in the way of anti-knock value that have been obtained by the Cross and other processes from certain specific charging stocks.

He did not say, however, what yield of these high anti-knock value fuels would be possible. The table prepared by Dr. Cross showing the anti-knock values obtained with different cracking stocks and found in various special fuels on the market, is published below:

The key to the numbers in this table are as follows:

(1) Straight-run gasoline made from crude oil from Russell, Kansas, this being a limited paraffin base oil field of uniform quality throughout.

(2) The standard 40 per cent benzol mixture with the Russell gasoline.

(3) Straight Red Crown Gasoline to which no tetra-ethyl lead has been added and as sold by the Standard Oil Co. in Kansas City.

(4) A gasoline made by the cracking of Smackover, Arkansas, heavy crude petroleum at the plant of Simms Petroleum Co. at Dallas, Texas, using the Cross cracking process exclusively.

(5) Gasoline made by the cracking of Smackover heavy crude petroleum at the plant of the Root Refineries Co., Eldorado, Arkansas, as made by the Dubbs cracking process and as sold by a jobber in Kansas City.

(6) Gasoline made by cracking Smackover heavy petroleum at the plant of the Lion Oil & Refining Co. of Eldorado, Ark., using the Burton Process, and as sold by a retailer in Kansas City.

(7) Gasoline sold by the Gulf Refining Co. at a filling station in Dallas, Tex., under the name "No-Nox."

(8) Gasoline sold by the Sinclair Refining Co. in Kansas City, under the name "H-C."

(9) Gasoline experimentally made by cracking kerosene at 1000 pounds pressure and 950° F. temperature.

(10) Gasoline made by cracking north Texas petroleum, using the Cross process under normal operation.

(11) Gasoline made from California kerosene by vapor-phase, low-pressure cracking by the "Pyro" process.

(12) A vapor-phase gasoline made by the Ramage process at Toledo, O., under the name "Cyclo."

(13) Gasoline made by the natural distillation of Mitchell county, Texas, crude oil.

(14) Gasoline made by the natural distillation of southern California crude oil.

(15) Gasoline made by cracking southern California petroleum, using the Cross process.

(16) A blending material obtained as a by-product in the manufacture of Blaugas at Omaha, Neb.

(17) Gasoline made by the normal cracking of southern Kansas crude petroleum, using the Dubbs process.

(18) Gasoline made by the cracking of Russian kerosene at the plant of the Medway Oil & Storage Co., England, using the Cross process.

All of the above gasolines represent exclusively commercial products, with the exception of Nos. 9 and 16. These products were obtained in most cases from local dealers and representatives.

### Dr. Egloff's Conclusions

DR. EGLOFF stated his conclusions as follows, regarding the motor fuel supply of the future:

"1. The future gasoline will be a blend of straight run gasoline and cracked derived from petroleum, coal tar, wood tar or shale oil.

"2. The future gasoline will yield double the mileage per gallon.

"3. The future gasoline specifications will be anti-knock and ease of starting the engine.

"4. Our potential future gasoline supplies will last for hundreds of years, and will be derived from the cracking of petroleum, coal tars, wood tars and shale oil."

Discussing the specifications and tests now demanded of motor fuel, Dr. Egloff said:

### "Color Has No Meaning"

THERE are still specifications which demand a water-white gasoline but as far as the performance of gasoline in an automotive cylinder is concerned color means nothing. However, it means something to the refiner who has to acid treat out certain colored components which are only present in traces, but in taking out the traces there is a material loss not alone in gasoline but also in its properties as an anti-knock motor fuel.

"It is a happy sign where one drives about the country to see in visible bowls not alone yellow gasoline but pink, red, green and blue in addition to water-white. The motor is no respecter of color and will operate as well with yellow as with water-white, blue, green or red gasoline. It may well develop that special gasolines will be put on the market to match the color of the car or as one refiner in Kentucky who plans a blue gasoline, naming it "Blue Grass Gasoline."

"Odor is another test that is too rigidly adhered to and really has little place in a specification for gasoline. To bring an average cracked gasoline to so-called good odor is wasteful of chemicals and adds to the loss of actual gasoline.

"The doctor test is one to determine the so-called sourness of a gasoline due to the sulfur compounds present. It has been shown that the doctor test does not react with all sulfur compounds present in a gasoline for there may be substantial percentages of sulfur present which are not disclosed at all by this test. On the other hand, with no sulfur compounds present in the gasoline the doctor test may show it to be sour. Hence this test has no real importance as disclosing the value of a motor fuel and should be eliminated.

### Sulphur Removal Expensive

THE removal of sulfur from gasoline, particularly those containing percentages as high as one, is an expensive procedure not alone in the cost of chemicals but also in the loss of valuable gasoline. In the refining of a one per cent sulfur content gasoline a loss of 20 per cent of gasoline resulted when meeting a market specification of fifteen-hundredths of one per cent.

| Key Number | Gravity Baume° | Initial Boiling Temp. | 20% Temp. °F. | 50% Temp. °F. | 90% Temp. °F. | Dry Temp. °F. | Benzol Equivalent: K. C. Testing Laboratory Method to Produce Standard Knock |
|---|---|---|---|---|---|---|---|
| 1 | 65.3 | 80 | 170 | 246 | 366 | 400 | 0 |
| 2 | 49.7 | 93 | 173 | 196 | 335 | 396 | 40 |
| 3 | 57.7 | 81 | 210 | 292 | 392 | 433 | 5 |
| 4 | 51.3 | 80 | 206 | 320 | 412 | 430 | 50 |
| 5 | 54.9 | 93 | 205 | 293 | 398 | 435 | 25 |
| 6 | 53.0 | 95 | 216 | 294 | 374 | 451 | 20 |
| 7 | 59.2 | 96 | 197 | 258 | 362 | 431 | 25 |
| 8 | 55.4 | 87 | 188 | 292 | 388 | 430 | 40 |
| 9 | 40.4 | 121 | 258 | 343 | 417 | 450 | 66 |
| 10 | 53.2 | 82 | 208 | 306 | 406 | 436 | 24 |
| 11 | 48.2 | 125 | 204 | 271 | 381 | 430 | 60 |
| 12 | 54.7 | 93 | 208 | 269 | 375 | 443 | 40 |
| 13 | 53.2 | 92 | 204 | 275 | 396 | 430 | 25 |
| 14 | 56.4 | 90 | 204 | 254 | 348 | 412 | 25 |
| 15 | 51.6 | 98 | 216 | 318 | 405 | 438 | 30 |
| 16 | 47.8 | 110 | 161 | 1188 | 252 | 348 | 130 |
| 17 | 57.2 | 100 | 222 | 302 | 388 | 426 | 10 |
| 18 | 57.2 | 94 | 214 | 274 | 310 | 398 | 45 |

"Less than one-half this loss would be encountered using approximately one-half the amount of chemicals, if the specifications were three-tenths per cent sulfur or above. It is not clear where motor difficulties ensue as a function of increasing percentages of sulfur in the gasoline.

"It would appear as if one-tenth of one per cent sulfur in a specification is an arbitrary upper limit for eastern gasolines and the whole subject of sulfur tolerance in gasoline should be thoroughly studied. Since the advent of the ventilation system in crank cases of motor cars, condensation of moisture therein is prevented, hence no sulfurous or sulfuric acid could form therein. The combustion of sulfur to sulfur dioxide and trioxide gives out energy and functions like any other gas in a motor. Fuel oil of high sulfur content is satisfactorily burned in a Diesel engine, hence the sulfur compounds in gasoline should burn satisfactorily.

"The future gasoline in my opinion will not have a color, odor, doctor or sulfur specifications as to its suitability, but will have instead high anti-knock properties and ease of starting a motor car on a cold day."

Dr. Egloff had nothing to say about the gumming problem, which is one of the difficulties sometimes encountered in cracked gasoline.

## Veteran Standard Man To "Take it Easy"

Staff Special

LOS ANGELES, Oct. 18.—W. L. (Billy) Andrews, who spent 26 years in the employ of the Standard Oil Co. of California, retired from active service Oct. 1, to take things easy and start that small farm he has been dreaming about for years. He served in various capacities with the Standard from scout and gauger in the early days, to pipe line positions, until recent years when he handled crude oil purchasing in the pipe line department at Los Angeles. A. E. Smothers is for the present handling the duties formerly under the supervision of Mr. Andrews.

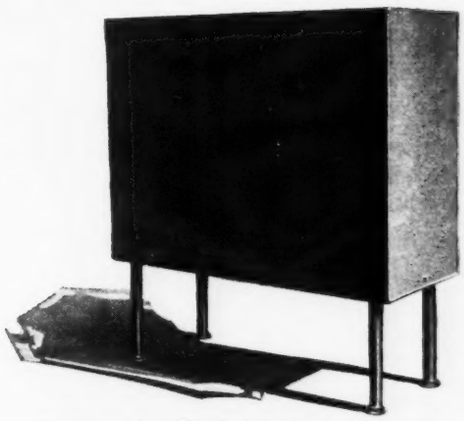
Mr. Andrews was a friend of practically every operator or producer selling to the Standard in Southern California. They looked upon him as a friend. They asked his opinion of various matters. They asked him to assist them in reaching important decisions. And he never failed them.

Mr. Andrews also was and is a store of valuable data having to do with the early history of the oil business in California. He knew the old timers, knew their troubles, their good times, and rejoiced with them when they succeeded, and condoled with them if the hole was dry.

Billy Andrews will be missed by thousands of the oil men doing business with the Standard, and by hundreds who sold their oil to other pipe lines.


SISTERSVILLE TANKS
MADE IN THE HEART OF THE OIL COUNTRY

# Better Steel Tanks For Basement Fuel Oil Use



*Rectangular Tank for Limited Space*

**Sistersville Fuel Oil Tanks have been manufactured in answer to an insistent demand from the fuel oil burner manufacturers and jobbers throughout the country who have recognized the high standard of quality in the Sistersville line and who have desired this same quality in the tanks used for basement storage.**

**These tanks are made in oval and rectangular types. The rectangular type can be furnished for installation in either horizontal or vertical positions. The vertical position is used in basements having limited floor space.**

**The same careful workmanship and high quality materials used in building the larger sizes of Sistersville Tanks is employed in our fuel oil line. Close inspection and Underwriter's Labels insure a degree of perfection that has distinguished the guarantee of this company above others engaged in the fuel oil field.**

***Write for free copy of our Illustrated Specification Folder***

**SISTERSVILLE TANK & BOILER WORKS**
**SISTERSVILLE W. VA.**

# BETHLEHEM
## WAX PLANT EQUIPMENT

***Filter Presses*** — ***Wax Moulding Presses***
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***Complete Wax Plants designed and built***
***Pumps, Stills, Towers, Condensers and other Oil Refinery Equipment***
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**BETHLEHEM SHIPBUILDING CORPORATION, LTD.**
**BETHLEHEM, PA.**
**GENERAL SALES OFFICES: 25 BROADWAY, NEW YORK CITY**

# Use of Electricity for Drilling Brings Biggest Improvement in Field

By Joe H. Russell
Gulf Production Co., Houston
*Before Fall Meeting, Petroleum Division, A. I. M. E., Tulsa, Oct. 11-12*

IN considering the subject assigned me for discussion before the meeting, it would seem that with the great number of wells being drilled in the Gulf Coast, there should be a great demand for and an opportunity to improve the methods of drilling wells and of producing oil from them. As a matter of fact, along with the demand and necessity for new and improved methods in operation there have been some improvements made.

We are now passing through a strenuous drilling campaign at Spindle Top and the quickest methods of drilling and completing wells are much too slow. Therefore, not a great deal of thought has been given to any new methods. However, you can not help but compare the present method and equipment used in the present day drilling campaign at Spindle Top with the drilling campaign that occurred there in 1901.

The difference in equipment and methods are staggering and the present day operators can hardly imagine how the old operators ever were able to drill a well. The "Old Timers" explain the reason as being that "Men were men in those days and not much machinery was necessary." Yet the development in 25 years of thought and study to the changed conditions of operations has brought about a great improvement in equipment and in methods.

I believe there has been a great deal more thought given to the development and improvement of drilling equipment and methods and to the completion of wells than has been given to the actual production operations.

### Drilling Methods and Equipment

THE greatest improvement that has been made in the methods of drilling and completing wells in the Gulf coast is the improvement made in the rotary equipment machinery used in drilling. Equipment more suitable and applicable to the duty imposed in drilling wells has been and is being steadily developed. The operators are now studying and are beginning to find out just what work, what duty the machinery will have to perform before a well can be drilled to the various depths in the quickest time and in the best possible manner.

I think more than ever before the oil operator is making careful diagnosis of drilling conditions, such as the character of formations to be drilled, the depth of the hole, the size of the hole, the manner and sizes of pipe to be set, the time required to drill to certain depths, then he knows what duty his equipment must be able to withstand and accordingly he designs the equipment to be used to perform the duty in the most workmanlike manner and in the quickest time. The drilling operation necessarily is becoming more and more a problem for the technical man who is practical. The technical man's duties are to diagnose and determine the faults and shortcomings of the methods, and the practical man, along with the technician, must correct them. We are endeavoring to design and specify just what kind of equipment is necessary and are not leaving it entirely in the hands of the manufacturers to give us what they think we need.

The keeping of complete progress records during the drilling of a well, charts which indicate and record time and energy consumed, amount of hole made, kind of formation drilled, during each minute's operation has opened the way for a complete scientific study to determine the best method of drilling. For instance, it has been determined accurately and with no guess work that during the progress of drilling a 3469-foot well in a Gulf Coastal field, which consumed 33 days, that only 17 per cent or 5.61 days was the drill bit actually on bottom making hole. That 33 per cent of the time the slush pump was in operation. The balance of the time was used up in going in and coming out of hole, setting casing, making pipe connections, repairs to rig, circulating, and waiting on material.

Actual records of time were taken to indicate how long it required to drill a foot in many different kinds of formations with different weights of drill bit on bottom and revolutions of rotary table.

### More Actual Drilling

FROM this information it would appear that an effort would be made to develop our machinery and improve our methods so as to permit the drill bit to be on bottom a greater percentage of time, and to determine how each formation should be drilled to the greatest advantage.

For instance, had our drilling machinery and methods permitted the bit to have been on bottom 25 per cent of the time with a corresponding amount of hole drilled, the well would have been completed in 2.6 days quicker time, which in labor, fuel and flush production would be a considerable amount of money.

I think that one method of increasing the time of the drill bit being on bottom making hole will be by the use of collapsible bits. It is destined to become more and more in use. Several test wells have been drilled with varied degrees of success. However, if it can be perfected and proven practical it will reduce the time of drilling a well at least 30 per cent, as bits can be changed, cores taken without pulling drill stem. The saving in labor, wear and tear on equipment and fuel will be very great as compared with the present method.

The high pressure, large horsepower boilers, the twin cylinder engines, the enormous slush pumps, the three speed heavy draw works, the make and break rotary, the large travelling blocks, the spring break out and make up post, the spring hook, the combination steam trap and lubricator for the pumps and engines, the steam breakout gun, are all developments which have improved the drilling operations during the past year or so.

I believe, however, that the greatest single improvement made in oil field operations recently has been the development and application of electricity to the industry, and the greatest improvement to the drilling end of the game has been the development of the Hild Universal differential drive for rotary drilling.

It is a scientific piece of machinery that is at once practical and flexible and has opened the way for the drilling of wells to be done on a scientific basis.

### The Hild Electric Drive

THE Hild electric rig, as you know, is two motor driven gears operating through a differential, one motor driving the draw works, the other driving the rotary. The speed of these motors can be set so as to regulate automatically the feed of the drill stem or weight of the drill bit on bottom to any desired speed or weight and once fixed by the driller it will stay fixed, and will feed automatically at the set rate of speed. The human equation in the form of the driller is eliminated after the motors are once set. No dependency is placed on him to feed the bit manually and he is under no fatigue stress. There is no question but what that it requires a scientific and practical knowledge of

drilling operations in order to make use of the flexibility and capability of the machine. The driller must be one who recognizes immediately the changes in the formation being drilled and upon recognition he must change his control so as to speed up or slow down the rate of speed with which he is feeding the drill stem. No two formations drill alike, that is can be penetrated with the same degree of rotation or weight of drill stem, and the driller can not set his control to feed the drill stem at a certain definite number of feet per minute or inches per hour and forget about it if he is to take full advantage of the equipment.

With this machine, and a good, practical, educated driller, well versed in the knowledge of formations, it has been demonstrated beyond any doubt that he, through experiment, has determined how different formations should be drilled to the best advantage. Very few drillers will drill any formation alike, that is with same weight on drill bit or same number of revolutions of the drill stem. This is because no hand fed drill stem can be fed uniformly for any length of time. The equipment will not permit it. Neither will the physical endurance of the driller permit it. There should be only one correct way of drilling each formation and with the Hild rig it can be so drilled if the driller has that knowledge.

The Haliburton automatic drilling machine, designed for either electric, steam, oil or gas engine operation is now being tested at Goose Creek and I understand is operating very satisfactorily.

C. R. Edwards, president of the Houston Engineers, Inc., Houston, Texas, has patented a new process for use in drilling wells. This method is only the addition of vibration to the bit of the ordinary hydraulic rotary system. The elasticity of the rotary drill stem is the secret of the success of the system of drilling. It permits the bit and a little of the lower end of the drill stem to be very rapidly vibrated up and down against the bottom of the hole. These vibrations are caused by rapid "water hammers" in the drill stem. These vibrations are set up in the drill stem by a hydraulic vibration generator driven by a high speed engine or motor. This machine is in course of construction and is not yet on the market.

### Production Methods

CONSIDERING strictly the production operations and the improvement that has been made, there have been few changes over the old time methods, especially as far as that part of the equipment under the ground.

It is true that the standard rigs proper are greatly improved, in that the old band wheel, long engine house, steam engine drive have been superseded by the use of a double reduction gear or a Lufkin worm gear. All parts of the rig are now being made out of steel as nearly as possible.

The actual pumping equipment still consists of a varied assortment of special

# BUCKEYE
## Truck Tanks
## Must be Considered

Firms in the market for sturdy truck tanks at the lowest price consistent with merit are bound to consider the Buckeye.

Welded construction throughout. Outlet flanges both riveted and welded—

Bulk heads welded between flanged compartment edges making a triple thickness on the edges.

Tanks available, oval or round—for 1 to 5 ton trucks.

**ALSO**

*Oil Burner Storage Tanks*
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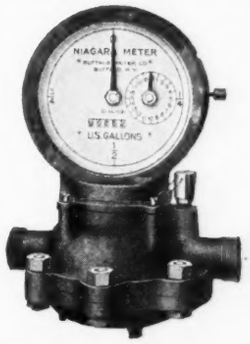
*"Specify Buckeye"*

**The Buckeye Boiler Co.**
**General Offices: 1616 E. McLain St.**
**Dayton, Ohio**

# NIAGARA GASOLINE METERS

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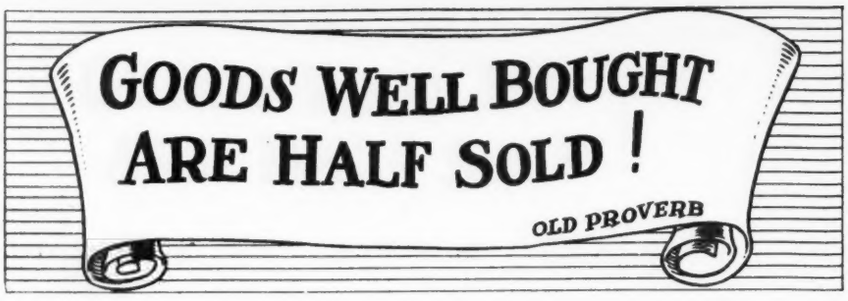


# OIL JOBBERS---Tack that above your desk!

100% Pure Pennsylvania Crude Oil is the base from which the generation-trained oil experts produce the oil products known as Penn-Empire.

The constantly increasing host of oil jobbers (over a 1000 now) is a tribute to the inherent goodness of Penn-Empire Products—

*Why not join in with a well established refinery like this that can supply your orders, as you want them, when you want them?*

The request for samples is always welcome—Would you allow us to send some to you?

Penn-Empire products are well made, well bought; therefore easily sold.

EMPIRE OIL WORKS INC.
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Tractor Oils, Motor Oils, Industrial Oils, Kerosene, Gasoline, Petrolatum

Refinery at Reno, Pa. Warehouses at strategic points.

WHEN YOU BUY PENN---EMPIRE YOU GET THE BEST


pumps, plunger and cup type, long stroke devices, but it seems in the Gulf Coast that each well has a pumping condition all its own and requires special attention and a different kind of pumping equipment.

There are so many sand strata with their different gravities of oil, various sand conditions, salt water actions with its effect on tubing, valves, balls and seats, that there can be no standardization. Equipment that will work good in one well will not pump in another.

The use of all steel valves, crosses, etc. for well connections is a decided improvement over the old cast iron valves, both from the standpoint of strength and the ease of handling.

If any one thing can be said to have more greatly improved drilling and production methods in the Gulf Coast than any other it is the general application of electricity to oil field operation. There is no oil field operation performed by steam energy today in the Gulf Coast to which electrical energy can not be applied to a greater advantage from view point of flexibility, power required and economy.

Our company will not purchase any more steam drilling rigs where electric power of a dependable character and of a fair rate can be obtained. We have 14 electric rigs in operation now and have six more on order.

As to their operation, we drilled 42 wells with them last year, varying in depth from 1000 to 4200 feet and found that they were as flexible as steam, more powerful, as fast and three times as cheap to operate. No extraordinary trouble was experienced. We have more than 500 wells being pumped individually by electricity and believe we have increased our production 10 per cent.

The Gulf Coast fields within the next year will have their production operations almost 100 per cent electrified.

**Variety of Services at This Station**

NORTHWOOD, IA., Oct. 18.—The "State Line Bungalow" has been erected on Jefferson highway on the Iowa-Minnesota state line here by the Northwood Oil Co. where tourist cars going into Minnesota will be registered, fishing licenses sold, and road and lake information dispensed. A kitchen and dining room have been included for the convenience of tourists. Shade trees are plentiful for those who prefer the open spaces during lunch hours.

A filling station will be operated in connection with the bungalow where Red Hat gasoline and motor oil will be sold. The station will be in operation next spring and will be run by the Rohr sisters, who are daughters of Charles Rohr, manager of the Northwood company.

WESTON, W. VA.—The automobile service station on Second St. here has been purchased by the Standard Oil Co. of New Jersey from Dr. G. I. Keener and Charles Goodwin. The station was handling Standard products.

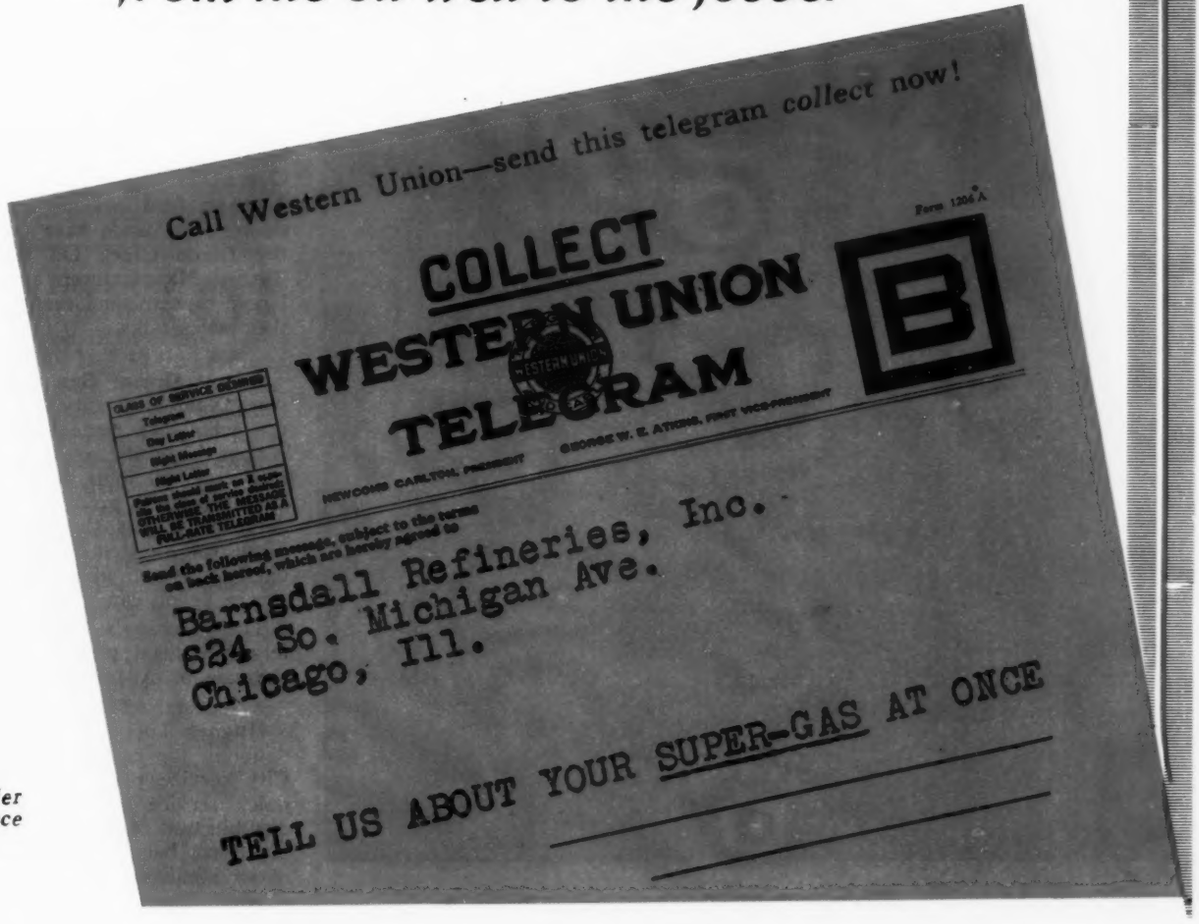
# DALL White —GAS

(U. S. *Pat. Off.*)

## *3 Modern Refineries*

**Wichita, Kansas—Barnsdall, Okla.—
Okmulgee, Okla.**

***—from the oil well to the jobber***




*or if you prefer use long distance phone or write.*

# New Equipment for Plant Improvement

## (Personal Notes of the Manufacturers)

National Petroleum News

## Semi-Portable Gasoline Plant Designed by Southwestern

A NEW type of gasoline plant is being installed in the Mid-Continent field by the Southwestern Engineering Corp. which retains many of the features of the portable plant and yet has more than three times the rated capacity of the small portables. The manufacturer calls his new plant a "semi-portable."

The portable plant brought out two years ago had a normal rating of 2000 gallons per day but in actual practice many have produced upwards of of 8000 gallons per day on flush gas. The "semi-portable" has a rated capacity of 7500 gallons per day and will operate with an overload up to 12,000 gallons per day.

Three steel frames carry all of the plant except absorber, water tower, scrubber tanks, steam plant and similar auxiliary equipment. These are shipped partially disassembled but all units are inter-piped and equipped with flanged connections to permit rapid re-assembly in the field.

The first section carries five pumps complete with oil and water manifolds, live steam and exhaust steam manifolds and lubricating system for pumps. The weight of these sections is approximately 10,000 pounds.

The heat exchanger, evaporator or still and pre-heater are placed on the second section with such auxiliary apparatus as steam traps, liquid level control and piping. The evaporator is a 16-foot by 60-inch bubble type still with eight trays. The total weight of this second section is 26,000 pounds.

The third section carries the oil cooler, dephlegmator, condenser, water separator traps for dephlegmator and water separator and look box. The total weight of this section is around 24,000 pounds.

Absorbers offered with the plant are bubble type towers 28 feet high with diameters varying from 48 to 72 inches depending on capacity required and weight ranging from 8000 to 16,000 pounds.

Fig. 1, is a photograph of one of the semi-portables fully assembled at the factory. It will be observed that the plant occupies very little space. It can be housed in a building 18 by 24 by 18 feet.

The first of these plants made was sold to the Skelly Oil Co. for use at El Dorado, Ark. Another went to the General Petroleum Co. in California, the third to the Comar Oil Co. at Three Sands in the Tonkawa field and the fourth and fifth plants to be made have been shipped to the Dixon Creek Oil Co. at Borger, Texas. Manufacturers are stressing the larger capacity and ready portability in their sales talks.

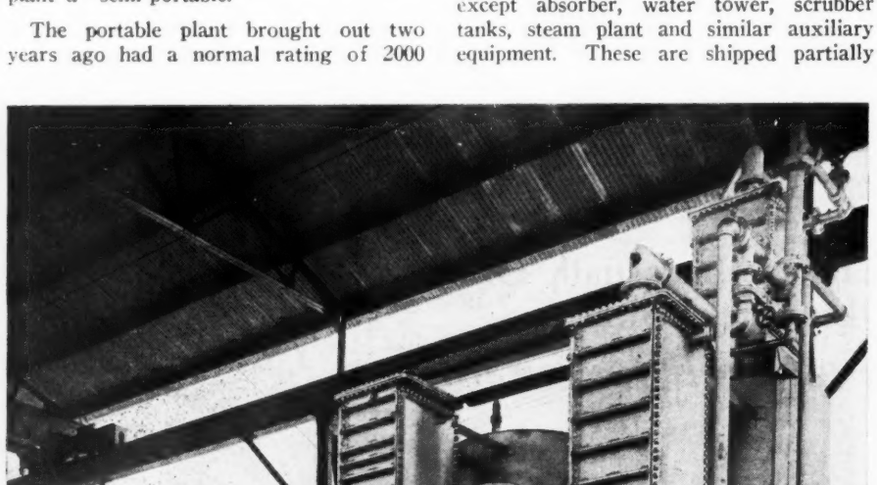


*Fig. 1.—Semi-Portable Gasoline Plant designed by Southwestern Engineering Corp.*

* * *

**Adams Grease Gun Corp., 329 Fifth** Ave., New York City, is mailing out to the wholesale trade literature on the Adams hydraulic grease gun and steel universal ball joint pipe hose, which it guarantees leak proof for one year. The company claims that the gun fits all lubricating systems, cuts labor costs one-half, is self filling and any kind of grease or oil can be used.

The company's legal department offers free legal protection to users on the sale of Adams grease guns.

* * *

**Hughes Tool Co., Houston, Tex.,** is doubling the capacity of its Oklahoma City service plant which will permit quick service on repairs to rock and disc bits and on recutting of cones. The plant has been equipped especially for major repair work and for recutting of cones.

## Bits Are Now Dressed By Steam Hammer

TULSA, Oct. 9.—Oil Well Supply Co. is announcing to the industry the new Bergquist steam derrick hammer, for dressing cable tool bits. It is the invention of C. H. Bergquist, of Okmulgee, Okla., who has been testing and developing the appliance through actual use on the derrick floor for the past two years. The hammer, which delivers 300 blows per minute, is designed for use either on the derrick floor or in an outside forge house. It dresses bits under 18 inches in one heat, and on larger bits, time required is said to be less than half that necessary when the ram method is used.

In addition to lightening the physical exertion of the drilling crew, a mechanical hammer saves time and therefore tends to better the well's drilling time. It also overcomes the natural tendency to put off bit dressing as long as possible on account of the labor ordinarily involved, a tendency which often results in tight holes resulting from failure to dress bits when they need it.

---

**During cold weather, paraffine deposits** in lead lines from oil wells to storage tanks are a frequent source of annoyance to operators handling paraffine-base crudes. An effective method for removing these paraffine deposits has been developed recently by an oil company in the southwest. Some calcium carbide (in lumps of the size known as "quarter") and a little water are fed into the line, according to the Linde Air Products Co. The carbide and water react, generating heat enough to melt the paraffine which is then picked up by the oil and carried on through the line. Heavy deposits of paraffine in lines a quarter of a mile long, it is said, have been successfully removed by this new method.

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**The Threaded Products Co. of Berkeley, Cal., is putting out the S. & J liquid** level control, which is described in the company's Bulletin No. 50. The fitting is particularly adapted to use in hot oil service, it is said, and is recommended by the company for regulation of liquid levels in stills, dephlegmators, absorption towers and balance tanks. The standard S & J control is designed for temperatures up to 800 F and pressures up to 50 pounds and operates equally well under pressure or vacuum. Controls for special temperature or pressure conditions are furnished by the company on order. Each liquid level control includes companion key ring flanges and pipe stubs ready for welding on lines.

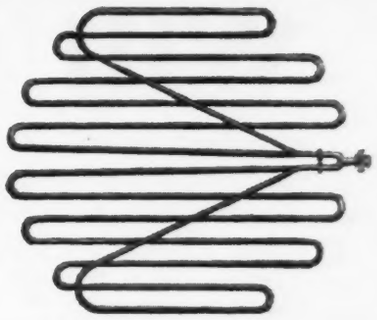
All important parts are of forged steel and all operating parts are mounted on the cover plate so as to be accessible.

In addition to the liquid level control the Threaded Products Co. manufactures a line of valves, cocks and tank fittings of various sorts.


**PITTSBURGH COILS**

GOOD old-fashioned extra heavy pipe coils assure greatest freedom from leakage. Electrically welded, continuous; tested under air pressure while submerged in water. Built for refinery and oil country use.

Made to your individual requirements. Send blue print or rough sketch for quotation.



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**We Solicit Your Inquiries On High Grade Gulf Coastal Lubricating Oils**

*200 to 2000 Viscosity*
*Pale and Red*

ZERO COLD TEST

**Shipments in Tank Cars, Compartment Cars and Steel Drums.**

KEEN & WOOLF
OIL COMPANY
Refinery on the Ship Channel
HOUSTON TEXAS
REFINERS FOR JOBBERS

# Good Will

is an important factor in any successful business. The Humble Oil & Refining Company appreciates that to hold your good will it is necessary to supply you with products, the sale of which will gain and hold the good will of your customers.

Humble Motor Oils satisfy. They are produced only from high-grade cold-test crudes and are "straight run." They are not mixed or blended. Humble Motor Oils are of a clean, beautiful amber color and have just the right body to properly lubricate all bearing surfaces, and when burned leave little carbon to foul the motor or contaminate the crankcase mixture.

## Humble Oil & Refining Co.

**Houston, Texas**

Producers - Pipe Lines
Refiners - - Marketers

*"Zero Cold-Test Oils"*

# New Oil Station Construction

National Petroleum News

**North Tarrytown, N. Y.—Ward Oil** Co., Inc., with headquarters here, is building bulk station at Ossining, N. Y., according to William A. Ward, president.

* * *

**Stockton, Mo.**—White Eagle Oil & Refining Co., Kansas City, Mo., erecting service station here.

* * *

**Tomahawk, Wis.**—Interstate Oil Co., with headquarters at LaCrosse, Wis., building filling station.

* * *

**Siloam Springs, Ark.**—Dees Bros., Wdington, Ark., will erect filling station and store.

* * *

**Poplar Bluff, Mo.**—Justrite Oil Co. to build filling station here and at Charleston, Mo.

* * *

**Eveleth, Minn.**—Standard Oil Co. of Indiana purchased three lots for service station.

* * *

**Tekamah, Neb.**—Standard Oil Co. of Nebraska bought site for service station.

* * *

**Sweet Springs, Mo.**—Henry Kroenke purchased site for filling station and garage.

* * *

**Columbus, Neb.**—Community Filling Station is completing filling station here.

* * *

**Staples, Minn.**—Staples Oil Co., P. O. Box 294, is building service station here.

* * *

**Red Wing, Minn.**—Economy Oil Co. has leased site for service station.

* * *

**Morrillton, Ark.**—Continental Oil Co., Denver, completing service station.

* * *

**Omaha, Neb.**—MonaMotor Oil Co. seeks permit for filling station.

* * *

**DeSmet, S. D.**—R. L. Folsom purchased site for filling station.

* * *

**Kerrville, Tex.**—Magnolia Petroleum Co. building filling station.

* * *

**Ashley, O.**—Standard Oil Co. of Ohio will build filling station.

* * *

**Oberlin, O.**—Cities Service Oil Co. to build service station.

* * *

**Childress, Tex.**—Tom Baley to erect filling station.

* * *

**Raceland, Ky.**—W. H. Wall building filling station.

**Konawa, Okla.**—J. T. Basinger is erecting building which will include filling station and garage.

* * *

**Canadian, Tex.**—Marland Refining Co., Ponca City, Okla., purchased site for service station.

* * *

**New Lexington, O.**—Service station is being planned here by Standard Oil Co. of Ohio.

* * *

**Kingston, O.**—H. B. Given Oil Co. opened tire store and expects to add filling station.

* * *

**Gridley, Kan.**—Carpenter & West, of Hartford, Kan., purchased site for filling station.

* * *

**Creighton, Neb.**—Blue Star Oil Products Co. purchased three sites for filling station.

* * *

**Kansas City, Mo.**—Standard Oil Co. of Indiana purchased site for service station.

* * *

**De Pere, Wis.**—Winona Oil Co. and Badger Oil Co. each will build filling station.

* * *

**Fon du Lac, Wis.**—Martin Gleason to build filling station at 337 Rosendale Ave.

* * *

**Florence, Kan.**—Marland Oil Co., Ponca City, Okla., to build filling station.

* * *

**Vail, Ia.**—J. R. Dudley, Churdan, Ia., bought site at Vail for filling station.

* * *

**Fayetteville, Ark.**—The Park Grocery will add filling station to its building.

* * *

**Wellsville, N. Y.**—Standard Oil Co. of New York to build filling station.

* * *

**Delaware, O.**—Standard Oil Co. of Ohio will erect service station.

* * *

**Ocilla, Ga.**—Standard Oil Co. of Kentucky erecting filling station.

* * *

**Salem, N. J.**—Solomon Weinstein seeks permit for filling station.

* * *

**Pharr, Tex.**—Gulf Refining Co. is building service station.

* * *

**Goose Creek, Tex.**—W. J.Foster completing filling station.

* * *

**Brownwood, Tex.**—The Texas Co. to build service station.

## First Aid Contest Is Planned by Council

Staff Special

TULSA, Oct. 16.—During the meeting of the American Petroleum Institute, to be held in Tulsa in December, the Petroleum Safety Council will hold its second annual petroleum first aid meet, as part of the educational program. It is expected that at least 20 six-man teams will be entered in the competition. Invitations have been extended to all Mid-Continent oil companies to send teams for the contest. The Bureau of Mines is furnishing a corps of trainers to help teams prepare for the event, and has placed its mine rescue car No. 6 in this service, detaching it temporarily from its itinerary through the oil fields and refineries of Oklahoma.

The contest will consist of four first-aid problems, and the judges will be men thoroughly familiar with this class of work. The large silver cup which was donated by the Petroleum Exposition last year, and which was won by the team of the Phillips Petroleum Co., will again be offered as first prize. Other prizes will be offered by the National Safety Council, the Mines Safety Appliance Co., and the Petroleum Safety Council.

The following companies have already entered one or more teams for the meet: Skelly Oil Co., Tidal Companies, Phillips Petroleum Co., Barnsdall Refining Co., Twin State Cil Co., Marland Refining Co., Mid-Continent Petroleum Corp., Pierce Petroleum Corp., Roxana Petroleum Corp., Empire Companies, Gypsy Oil Co., Continental Oil Co., Independent Oil & Gas Co., Carter Oil Co.

## Pantepec of Venezuela Offers More Stock

NEW YORK, Oct. 16.—The Pantepec Oil Co. of Venezuela, which was recently chartered in Delaware, has offered at $12 a share 315,000 shares of capital stock. Authorized capital is 2,000,000 no par shares and 1,500,000 shares will be outstanding with the present offering, which is being made by a syndicate headed by A. A. Housman-Gwathmey & Co. and California banking interests.

William F. Buckley, president of the company, has been active in developing oil lands in Mexico and Venezuela for years. It is said the Union Oil Co. of California has contracted to develop part of Pantepec's concessions in Venezuela, which amount to 4,700 square miles.

---

LOS ANGELES, Oct. 16.—D. A. Cleveland has been appointed sales manager of the Regan Sales Co. to handle sales in California. The Regan Sales Co. handles sales for the Regan Forge and Engineering Co. of California. Mr. Cleveland has been connected with several oil field equipment concerns on the West Coast and is well known to the fraternity.


FUEL OIL — GAS OIL — KEROSENE — GASOLINE

*Golf Ball Eccentricities*

*No. 2 of a series. This incident, like all the incidents described in this series, really happened. Information furnished through the courtesy of the "American Golfer."*

# *Isn't This* the Height of Good Fortune?

On an Irish course a golfer drove considerably out of bounds. The ball hit the roof of a nearby cottage, rebounded to the fairway and dropped into the hole, giving the player a hole in one!

Luck plays some part in golf, just as it does in everything else we do; but the consistent records of such leaders as Bobby Jones show that in the long run skill, training and perseverance produce their own good fortune.

Similarly, in buying petroleum products, you may get good service for a while from an inexperienced or slipshod source, but in the interest of consistently good service, it will pay you to tie yourself to a supplier fitted by experience, reputation and high standards to render good service *all the time.*

## SPENCER PETROLEUM CO.

***All Petroleum Products***

STABILITY SPENCER SERVICE OILS SATISFACTION

CHICAGO
1331-1333 Peoples Gas Bldg.
Harrison 9630-1-2-3-4

KANSAS CITY
700 Orear-Leslie Bldg.
Harrison 6180-81
Long Distance 65

WICHITA FALLS
204 City Nat'l Bank Bldg.
Phone 3480

TULSA
1039 Kennedy Bldg.
7857
Long Distance 37

DETROIT
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## ALLISON COUPON BOOKS

Are you protected against the troubles caused by inaccurate Coupon Books—why experiment with others?

*Write us for samples and prices*

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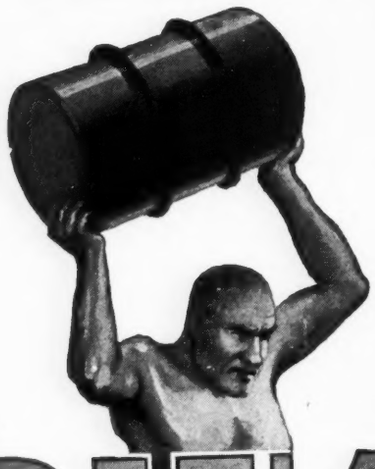


"DEFIANCE"

UNDER THE SKIN

THE skin of a steel barrel is the "specification". It covers gauge of steel, size, shape, style and perhaps color of paint to be used.

But under the "skin" you find the character, the integrity, the ideals of the steel barrel manufacturer—and these are more important than specifications.

Have you ever heard of a Defiance Steel Barrel not living up to *MORE* than the specifications called for?

Neither have we.

THE AMERICAN STEEL PACKAGE CO.

Defiance, Ohio

"The House of Drum Faucets"

STEEL DRUM ACCESSORIES CORP.
BUFFALO, NEW YORK

# Oil Patents Issued Recently

## Refining

**Motor Fuel and Its Manufacture.**—Ernst Johansen, Fall River, Mass., assignor to Eew England Oil Refining Co., Fall River, Mass. Filed Apr. 4, 1924 No. 1,601,215.

**Method of Making a Novel Motor Fuel.**—Ernst Johansen, Fall River, Mass., assignor to New England Oil Refining Co., Fall River, Mass. Filed Apr. 4, 1924. No. 1,601,216.

**Rectifier-Control Apparatus.**—William A. Peters, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Apr. 28, 1923. No. 1,601,320.

**Hydrogenation and Production of Non-sludging Oils.**—Herbert Raymond Moody, New York, N. Y. Filed May 28, 1923. No. 1,601,406.

**Treating Hydrocarbon Oils.**—Edson R. Wolcott, Los Angeles, assignor to The Texas Co., New York, N. Y. Filed Oct. 1, 1924. No. 1,601,421.

**Production of Lower-Boiling Distillates from Higher-Boiling Petroleum Hydrocarbons.**—Almer McDuffie McAfee, Port Arthur, Tex., assignor to Gulf Refining Co., Pittsburgh, Pa. Filed Apr. 25, 1925. No. 1,601,636.

## Production

**Fabricated Derrick.**—Burton Black, Redondo Beach, Calif., assignor of one-sixth of Frederick L. Feisthamel, one-sixth of Arthur J. Carr, and one-sixth to Thomas A. Collins, all of Los Angeles, Calif. Filed Nov. 10, 1925. No. 1,601,059.

**Fishing Plate.**—Michael L. Roshetko, Cleveland, Ohio, assignor to The Grabler Manufacturing Co., Cleveland, Ohio. Filed Sept. 12, 1924. No. 1,601,086.

**Double-Capacity Well Pump.**—Napoleon Fletcher, Farwell, Tex. Filed June 13, 1925. No. 1,601,114.

**Relief Valve for Deep-Well Pumps.**—Charles B. Lewis and Edgar D. Robertson, Los Angeles, Calif. Filed Dec. 14, 1925. No. 1,601,179.

**Wire-Line Drilling Clamp.**—Clyde S. Wright, Toledo, Ohio, assignor to The National Supply Co., Toledo, Ohio. Filed Feb. 10, 1926. No. 1,601,197.

**Cementing Barrel.**—Erd W. Crowell, Los Angeles, Calif. Filed Mar. 7, 1925. No. 1,601,239.

**Derrick Clamp.**—John D. McEwen, Pittsburgh, Pa., assignor to Lee C. Moore & Co., Inc., Pittsburgh, Pa. Filed Mar. 29, 1924. No. 1,601,254.

**Elevator for Well Casings.**—Gustavus A. Montgomery, Titusville, Pa., assignor to Titusville Forge Co., Titusville, Pa. Filed Feb. 25, 1924. No. 1,601,369.

**Oil-Well-Derrick Brace.**—Arlan L. Bowers, Bristow, Okla., assignor to Frank M. Mahan, Earnest McCarty, and Carl H. Wesse, all of Tulsa, Okla. Field July 5, 1923. No. 1,601,386.

**Well Tool.**—Omar A. Cavins, Los Angeles, Calif. Filed Jan. 17, 1923. No. 1,601,430.

**Deep-Well Pump.**—Leroy G. Gates, Bakersfield, Calif., assignor to Standard Oil Co., San Francisco, Calif. Filed Feb. 25, 1925. No. 1,601,472.

**Roller Bit.**—Edward F. Raymond, Santa Fe Springs, Calif. Filed Mar. 23, 1925. No. 1,601,646.

**Tubing Drain.**—Lewis C. Burright, McKittrick, Calif. Filed May 24, 1926. No. 1,601,676.

## Miscellaneous

**Oil-Dispensing Device.**—Harold G. Davis, Denver, Colo., assignor to The Davis and Son Manufacturing Co., Denver, Colo. Filed July 13, 1925. No. 1,601,200.

**Method of Manufacturing Benzol.**—Ira W. Henry, Greenwich, Conn., assignor of three-twentieths of Joseph E. Stevens, New York, N. Y.; one-twentieth of Edward S. Beach, Ridefield, Conn.; one-tenth to Arthur Woods, New York, N. Y.; one-tenth to Courtland Linkroum, Hackensack, N. J. Filed Nov. 2, 1925. No. 1,601,213.

**Method of Purifying Aromatic Alcohols and Derivatives.**—Mark E. Putnam and Joseph W. Britton, Midland, Mich., assignors to The Dow Chemical Co. Filed Oct. 1, 1925. No. 1,601,509.

PURE PENNSYLVANIA

LESS CARBON RESIDUE

# HARTOL MOTOR OILS

LIGHT - MEDIUM - HEAVY - EXTRA HEAVY

HIGH FLASH POINT

HIGH VISCOSITY

Four grades of motor oil of sky high quality—any distributor will be glad to sell them under his own name and brand and thus strengthen his position with his customers. The quality of these motor oils is assured; they are refined from PURE PENNSYLVANIA CRUDE in HARTOL'S own refinery at Franklin, Penna. These new blends have a high flash point, high viscosity, and a remarkably low carbon residue.

***At Booth No. 2***

***Steel Pier, Atlantic City***

*We'll gladly tell you anything else you want to know about HARTOL PRODUCTS.*

HARTOL

PRODUCTS CORPORATION

NEWARK NEW JERSEY

# HERE & THERE

National Petroleum News

*P. A. Brewer*

***A member of the Exhibitors Committee of the National Petroleum Marketers Association for the convention of Oct. 26 to 28 which will be held at Atlantic City. Mr. Brewer is treasurer of Devices Corp., Cambridge, Mass.***

**Mr. Goodale, of the Columbia Shale** Oil Co., of Colorado, accompanied by Mr. Conacher and Mr. Brown consulting engineers of Scottish Oils, Ltd., were recently in New York inspecting the plant of the American Hydrocarbon Co., Inc., preparatory to the Scottish company's adoption of the American Hydrocarbon lead jacketed low temperature process for the treatment of shale, according to William J. Dallas, secretary of the latter company.

* * *

**Fred E. Bergfors, treasurer of The** Quincy Oil Co., Quincy Adams, Mass., and Mrs. Bergfors left Sept. 29 for the 31st annual district conclave of Rotary International at Poland Springs, Me. Division B, of which Quincy is a section, was scheduled to attend the conclave on Sept. 30, Oct. 1 and 2. That division had charge of the luncheon on Sept. 30, according to E. C. Mahoney, secretary to Mr. Bergfors.

* * *

**C. E. Whiddon, proprietor of the** Greenville Woco Pep Co., Greenville, Ala., recently installed another gasoline pump at his station and is selling Purol gasoline along with WOCO products. Mr. Whiddon reports business in his territory good.

**Frank Brewster, petroleum engineer** of the U. S. Bureau of Mines, Washington, D. C., who has been spending some time at home at Weston, W. Va., with his father, Harry Brewster, superintendent at Weston for the Hope Natural Gas Co., gave a lecture before the West Virginia Natural Gas Association at Parkersburg. A day or so later he entered the hospital for the purpose of tonsil extraction, reports Karl L. Hoskins, secretary of Weston Oil Corp., Weston.

* * *

**W. S. Gilmore, for several years a** salesman covering New York state, Michigan and contiguous parts of Canada for the Fred G. Clark Co., Cleveland, on Oct. 1 joined the Oil Jobbers' Corp., Buffalo, N. Y., of which L. Rex Babbitt is manager. Mr. Gilmore will have headquarters in Cleveland and cover Ohio and southern Michigan.

* * *

**J. J. Sharum, president of the Ozark** Oil & Gas Co., Walnut Ridge, Ark., was recently appointed first lieutenant governor of Arkansas. Inasmuch as Mr. Sharum is only 30 years old, he perhaps can lay claim to being the youngest lieutenant governor in this country, according to J. B. Sexton, manager of the company.

* * *

**Simon Dimet, owner of the Simon Oil** Co., Niagara Falls, N. Y., has returned with his family from Crystal Beach, Ont., where he spent the summer at his summer home.

## Junior Here and There

**W. R. (Bill) Capron, assistant to** Henry L. Phillips, president of the Sinclair Crude Oil Purchasing Co., is the proud father of a recently arrived son, who has been named William Campbell Capron.

* * *

**L. Dale Wooddy, valuation engineer** for the Independent Oil & Gas Co., with Tulsa headquarters, has a new boy out at his house. The young man has been named L. Dale, Jr., and weighed 7¾ pounds on arrival. Mr. Wooddy in addition is the father of twin girls.

* * *

**"Cigars are due" is the way J. C.** Winslow, manager of advertising for the Graver Corp., East Chicago, Ind., captions the announcement of the birth of an 8½ pound boy at the home of Mr. and Mrs. Tom Crosby on Sept. 18. Mr. Crosby is tank salesman for the company.

*Howard A. Winton*

***A member of the Exhibitors Committee of the National Petroleum Marketers Association for the convention of Oct. 26 to 28 which will be held at Atlantic City. Mr. Winton is general branch manager of The Heil Co., Milwaukee, Wis.***

**Thomas D. Hudepohl, salesman out** of Tarentum, Pa. for Waverly Oil Works Co., has just completed a trip of 1725 miles through New Jersey, Maryland, Virginia and D. C. He reports seeing a large crop of fruit, tobacco, and peanuts and states that the Shenandoah valley, with its caverns, contains the "wonders of the world."

* * *

**Miss J. H. Smith, assistant treasurer** of the Fidelity Oil Corp. of Kentucky, Fort Worth, Tex., is visiting Stephens, Eastland and Wichita counties, Tex. properties of a subsidiary company, The Texas Fidelity Oil Corp., reports J. C. Hall, general manager.

* * *

**E. A. Watts, president of the Miller** Improved Gas Engine Co., Springfield, O., has been visiting Kansas, Oklahoma and Texas.

* * *

**G. A. Ritnour, manager of the Omar** Gasoline Co., Wichita Falls, Tex., recently returned from a trip through the East.

* * *

**O. L. Cordell, formerly vice president** of the Waite Phillips Co., Tulsa, is enjoying a vacation at Hot Springs, Ark.

# ON THE LAZY BENCH

National Petroleum News

### Ruined by the Women

Herk heard of a sad case the other day. It seems that along about 1913 an advertising man by the name of Walker drank an extra cup of coffee one night and came down to the office next morning with a brilliant idea.

The idea was revolutionary and daring but he sold it to the President. It was for a trade mark for the company and consisted of a circle drawn around a woman's ankle. The woman's foot showed the use of the product and the ring of the circle extended right up to —and past—the curve in the lower limb. Well, the ad attracted a lot of attention and was a knockout at the time.

Now, after spending millions of dollars in making the trade mark known, the company finds it has no attention value. Walker has been let out and on hearing of his record, nobody will hire him. A sad case.

—Herk U. Lee's Log Book, Hercules Supply Co.

◈ ◈ ◈

### Service Station Nomenclature

L. V. Surtees of the Mid-Continent Petroleum Corp., with headquarters in Chicago tells this one:

A jobber recently had a customer drive into his station for a new anti-knock brand of gasoline being put on the market by Mr. Surtees' company.

"What's the flash on that gasoline?" the customer demanded.

The jobber studied a second, and then replied:

"Fifty feet a second."

"Fill 'er up," ordered the customer.

◈ ◈ ◈

### Treating 'Em Ruff!

Jeff Steen (Texas Co.)—"Van, I saw about fifty dead rabbits yesterday while hunting."

Van Tassel (Our Own)—"Gosh, who killed them?"

Jeff—"The boll weevils run 'em to death trying to get the cotton out of their tails."

Unloading Rack

◈ ◈ ◈

### Not So Good

Steno—"Mr. Howland, I had an awful fright at the show last night."

D. P. Howland (Standard, N. Y.)—"I know it. I saw you with him."

—Unloading Rack

◈ ◈ ◈

### Liquid Measure

According to a college humorist, "Two pints make one quart; two quarts make one wild."

—Doherty News.

### Two of a Kind

A soldier went to his colonel and asked for leave to go home to help his wife with her spring cleaning.

"I don't like to refuse you," said the colonel, "but I've just received a letter from your wife saying that you are no use around the house."

The soldier saluted and turned to go. At the door he stopped, turned and remarked:

"Colonel, there are two persons in this regiment who handle the truth loosely, and I'm one of them. I'm not married."

—Bottles

◈ ◈ ◈

Judge: "I can't understand a big husky man like you beating a poor frail little woman like your wife!"

"But she keeps nagging and taunting me until I lose my temper."

"What does she say?"

"She yells, "Hit me! I dare you! Go ahead! Just hit me once and I'll have you dragged up before that bald-headed old fossil of a judge!"

"Case dismissed."

—The Booster

◈ ◈ ◈

### Honest At Least

The memory-training expert was lauding the merits of his system.

"Why not take a course in efficiency training?" said he.

"I can show you how to earn more money than you are getting."

"I do that now"! said his victim morosely.

—Independent Topics.

◈ ◈ ◈

### How Cutting

"Good heavens, man, what is the matter with your face? Were you in an automobile accident?"

"No, I was being shaved by a lady barber when a mouse ran across the floor."

—The Booster.

◈ ◈ ◈

Doctor: "Mr. Barker is inconsiderate. After we invited him to a splendid dinner cooked by your own hands, he gets a frightful case of indigestion."

Wifey: "Well?"

Doctor: "Then he sends for another doctor to cure him."

—The Booster

◈ ◈ ◈

"Just one more glass, boys, and then we'll all go home," said the dishwasher as he laid down the soap.

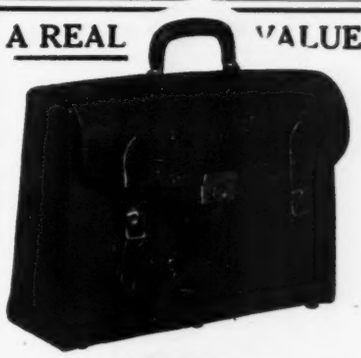
—The Booster.

The
NATIONAL REFINING COMPANY
PETROLEUM PRODUCTS

THREE MODERN REFINERIES:
Marietta, Ohio Refinery
operated on Pennsylvania Crude
Findlay, Ohio Refinery
operated on Ohio Crude
Coffeyville, Kansas Refinery
operated on Midcontinent Crude

National Headquarters
NATIONAL BLDG., CLEVELAND, O.

A REAL VALUE

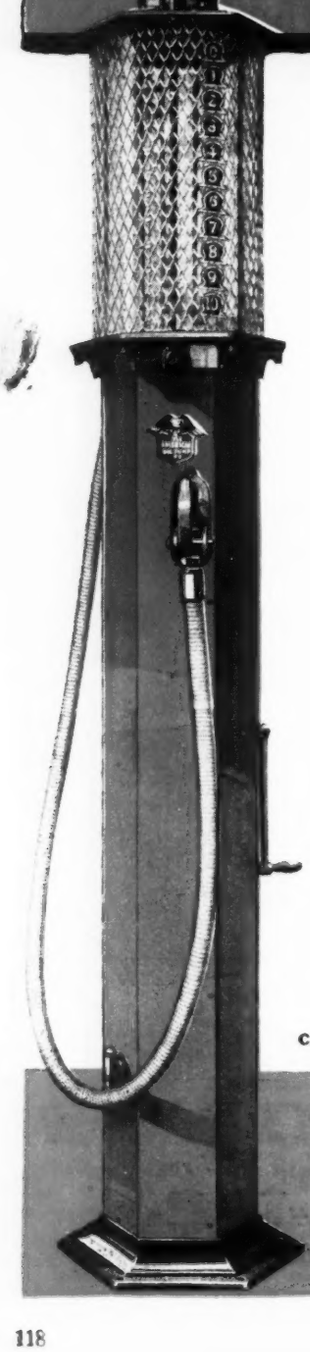


Complete
Net only
$7.50

L-U-C-E 302K Folio is made of heavy, double weight muleskin, with reinforced bottom and strong lock, handle and straps. The edges are turned and lock stitched. One of the 3 roomy pockets contains an inner Case which holds 6 four oz. bottles and 5 grease jars. It is covered with washable Keratol and lined with velvet. Your name embossed in gold *free*. Satisfaction *guaranteed*.

*Other Styles in our FREE Catalog*

L-U-C-E
*Builders of Sales Luggage*
614 Delaware KANSAS CITY, Mo.




Yes, it's here? The **Lowest Priced Good Pump made!**

A high-grade visible pump with 10 gallon container and stationary overflow, containing the same rust, dirt and fool-proof piston unit that has been used in our higher priced pumps.

# American "Economee" Pump

A wonderfully attractive pump with its graceful pillar-like appearance—a pump that pays for itself in the shortest possible time, that gives service every hour of the day and costs practically nothing for upkeep.

And it operates with a crank handle, *turning continuously* in *one* direction, not with a jerky, back and forth movement.

Note carefully its rigid construction, its simple and effective mechanism, described on next page—and then remember that back of this pump is over 17 years' experience and high reputation of the manufacturers for making the *best* in gasoline pumps.

Fill out and send in coupon *now* for *low* prices and full information about this remarkable pump.

**The American Oil Pump & Tank Co.**
**1713 Dalton Street** **Cincinnati, Ohio**

**Cut 1327**

**The American Oil Pump & Tank Co.,**
**1713 Dalton St., Cincinnati, Ohio**

Please send information and prices on:

☐ Cut 1427 ☐ Cut 1327 ☐ Cut 1425 ☐ Cut 1325

.....

.....

# Refinery - Tank Wagon Markets

National Petroleum News

# Domestic Buying of Light Gasolines Increasing in Mid-Continent

Staff Special
TULSA, Oct. 18

GASOLINES of 60° gravity and lighter, due to steadily increasing demand from jobbers, held their ground this week in the Mid-Continent refinery markets while prices of the lower gravity goods were fractionally lower.

The season for the lighter gasolines is near and jobbers are putting in a supply to be protected when frosty mornings make automobile engines harder to start.

Refiners in north Texas have been able to keep their high gravity gasolines well sold up, although some sales for over October have been booked at considerably under the spot market. Refiners making these sales, it was reported, had discounted any effect a crude or tank wagon reduction would have on the general market structure.

In Oklahoma comparatively few refiners are cutting high gravity gasolines thus far, and at least three of this group are using almost their entire output at their own service stations. Arkansas and Louisiana refiners make little gasoline above U. S. Motor specifications, while in Kansas a few refiners have started to make small quantities of the lighter grades.

Exporters have shown no interest in the market for some time, but the representative of one large exporting company said Friday that he doubted if any large quantity of export grade high gravity gasoline could be obtained in the Mid-Continent for immediate shipment.

A Tulsa factor was reported to be inquiring this week for offers on up to 400 cars of 64-66, 375 end point gasoline for shipment over the next four months at a flat price. So far as could be learned no orders had been placed. He was seeking the gasoline primarily for speculative purposs, it was said.

### Low Gravities Fading Out

WHILE the higher gravities have been staging a part comeback, the lower gravity gasolines have been rapidly fading from the picture for this year. While refiners who are making 56-58 and 58-60, 450 end point gasolines, are still booking orders in fair quantities, there has been a noticeable slackening in demand, especially from the jobbing trade in the northern states.

The reduction of gasoline by the Atlantic Refining Co. the middle of the week followed by reductions of both gasoline and kerosene by the Standard Oil Co. of Kentucky, made a few factors here apprehensive of the Indiana tank wagon structure, but the prevailing opinion was that this territory was in no immediate danger.

In Oklahoma 58-60 U. S. Motor lost ¼ cent during the week. Orders continued to be mostly for small lots, and for rush shipment. One large factor said yesterday that his business the first of the week was quiet but that in the last two or three days he had been forced to do a little buying on the outside.

The demand for natural gasolines has been comparatively slow all week, and prices have gone down ¼ to ½ cent. Grade A was the most active and was sold generally at 9¼ cents. One order for a quantity of Grade A or AA for movement to the Gulf was circulated in Oklahoma late in the week and finally placed at 9 cents a gallon Another factor received a rush order for some Grade AA. In order to get immediate shipment. he paid 9⅛ cents, and put the shipment in a train which was just ready to move out.

More Grade BB has been offered this week, and some distress material was showing up Saturday. Grade C also was moving in only small quantities. One factor that buys Grade C regularly, placed two orders today for shipment next week at 8½ cents.

### Kerosenes Weaker

THE kerosene market continued to weaken, being aided somewhat by tank wagon reductions by the Standard of Kentucky, the Standard of Indiana, the Standard of Nebraska and the Magnolia Petroleum Co. The reduction in Magnolia territory was 2 cents, in the others' territories 1 cent.

The fall in prices following the tank wagon reductions was only fractional, however, the decline already having been generally discounted.

Distillates were slightly affected by the kerosene price cuts, but the general opinion here apparently is that the recession is only temporary. It probably is true that refiners who have been cutting deep into their distillate stocks to produce kerosene may ease up and make more of the distillates; it does not stand to reason that any appreciable increase in distillate production will result unless kerosene prices go still lower. It costs only a fraction of a cent to treat kerosene, and as long as there is a spread of 1 cent between distillates and kerosene, refiners naturally will cut for that extra amount.

Kansas refiners have been in excellent shape on distillates this fall. Little of distillates is available in that state at present.

### Gas Fuel Oils Steady

ZERO cold test gas oils, both straight reduced and cracked grades, have been in steady demand this week. One or two refiners have advanced their quotations to 4½ cents and report they are practically sold up.

Gas oil in Arkansas and Louisiana, however, has been slower. The price season is almost over in Arkansas, and prices consequently have lost some ground.

Low cold test fuel oils are holding their own in excellent fashion, although the buying has been spasmodic again this month A considerable quantity of high cold test fuel oil has been offered, but prices have shown no tendency to break.

Several large fuel oil dealers have been "educating" their trade to the heavier grades of fuel oils this year. The representative of one large company said Friday that the company had "sold" the idea to a big buyer of 24-26 and 26-30 fuel oil with the result that $10,000 was spent to change burning equipment. In a short time since the change the buyer has saved more than $4000 on its fuel bill, it was said.

Considerable 28-30 gravity fuel oil has been offered out of the Panhandle district in Texas at prices as low as $1.45 a barrel. This oil, according to check made by several Tulsa buyers, is from Panhandle crude, and some kerosene has been thrown into the fuel to bring up the gravity. The oil still has a cold test of 80° F. or higher, and as far as can be learned has not been easy to move even at such a low price. One

(Continued on page 125)

# JENKINS CRACKING PROCESS

PRODUCES QUALITY GASOLINE

*Facts from performance*

**27 Units**

**of the Jenkins Cracking Process are now operating or under construction in**

**14 Refineries**

**——an increase, in less than two years, from three Units in one Refinery.**

GRAVER Corporation Founded 1857

EAST CHICAGO, INDIANA

NEW YORK Grand Cent. Term. · CHICAGO Steger Building · TULSA Atlas Life Bldg. · HOUSTON West Building

# Refinery Markets on Light Oils and Lubricants

Pennsylvania, Oklahoma, Kansas, North and South Texas, Louisiana, Arkansas, California and New England

## GASOLINE AND NAPHTHA

| | Prices Oct. 18 | Prices Oct. 11 | Prices Oct. 4 |
|---|---|---|---|
| **PENNSYLVANIA** | | | |
| 52-54 Naphtha | 12 12¾ | 12¾ 12¾ | 12¾ 12¾ |
| 54-56 Naphtha | 12¾ 12½ | 12½ 13 | 12½ 13 |
| 58-60 Gasoline | 12¾ 12½ | 12½ 12¾ | 12¾ 13 |
| 60-62 Straight-run gasoline | 13 -13½ | 13 13½ | 13½ 13¾ |
| 64-66 Straight-run gasoline | 14 14½ | 14 14½ | 14 14½ |
| 68-70 Straight-run gas. 350-360 E.P | 14¾ 15 | 14¾ 15 | 14¾ 15 |
| 68-70 Straight-run gas. 305-320 E.P | 19 20 | 18 19 | 18 19 |
| **OKLAHOMA** | | | |
| 48-50 450 E. P. naphtha | 9½ - 9¾ | 9¾ 10 | -10 |
| 50-52 450 E. P. naphtha | 9½ - 9¾ | 9¾ 10 | 10 |
| 56-58 450 E. P. gasoline | - 9⅝ | 9⅝ 9¾ | 9¾ 9⅞ |
| 56-58 U. S. Motor gasoline | 9⅝ 9¾ | - 9⅞ | 9⅞-10 |
| 58-60 450 E. P. gasoline | - 9⅝ | - 9¾ | 9¾ 9⅞ |
| 58-60 U. S. Motor 487 E. P. | 9¾ 10 | 10 -10¼ | 10 10¼ |
| 60-62 400 E. P. gasoline | 10½ 10¾ | 10½ 10¾ | 10⅝ 10¾ |
| 64-66 390 E. P. gasoline | 10¾ 10⅞ | 10¾ 11 | 10⅞ 11 |
| 64-66 375 E. P. gasoline | 11 11¼ | 11 11¼ | 11 11¼ |
| 68-70 350-360 E. P. gasoline | 11⅜ 11¾ | 11¾ 11⅞ | 11¾ 11⅞ |
| 64-66 487 E. P. blend | 9⅜ - 9¾ | 9¾ 10 | 9¾ 10 |
| **KANSAS*** | | | |
| 58-60 U. S. Motor gasoline | 10 -10¼ | 10½-10¾ | 10¾-10¾ |
| *F. O. B. refinery Kansas destination. | | | |
| **NORTH TEXAS** | | | |
| 48-50 450 E. P. naphtha | - 9¾ | - 9¾ | - 9¾ |
| 56-58 450 E. P. gasoline | - 9½ | - 9½ | 9⅝ 9¾ |
| 58-60 450 E. P. gasoline | - 9⅝ | 9½ 9⅝ | 9¾ |
| 56-58 U. S. Motor gasoline | 9⅝ 9¾ | 9¾ - 9⅞ | 9¾ 9⅞ |
| 58-60 U. S. Motor gasoline | 9¾ 10 | -10 | 9⅞ 10 |
| 64-66 390 E. P. gasoline | 10½ | -10½ | 10½ |
| 64-66 375 E. P. gasoline | 10⅝ 10¾ | -10¾ | *10½ 11 |
| 68-70 350-360 E. P. gasoline | 11⅜ 11¾ | -11¾ | -11¾ |
| **NORTH LOUISIANA** | | | |
| 58-60 U. S. Motor 487 E. P. | 10 -10¼ | 10¼-10⅜ | 10¼-10⅜ |
| **ARKANSAS** | | | |
| 56-58 450 E. P. gasoline | - 9¾ | 10⅜-10¼ | -10¼ |
| 58-60 450 E. P. gasoline | - 9⅞ | -10¼ | -10¼ |
| 58-60 U. S. Motor gasoline | 10 -10⅜ | 10¼-10½ | -10½ |
| **CALIFORNIA** | | | |
| *54-58 U. S. Motor 487 E.P. | 9 - 9½ | 9 - 9½ | 11½-12 |
| *58-61 U. S. Motor, 487 E.P. | 10½-10¾ | 10½ 10¾ | -12½ |
| *42-45 Engine distillate, 445-480 E.P. | 7 - 7½ | 7 - 7½ | 9¼-10 |
| *2c tax included. | | | |
| **NEW ENGLAND** (F. O. B. Boston and Fall River) | | | |
| 58-60 U. S. Motor gasoline | -12⅝ | -12¾ | -13 |

## NATURAL GASOLINE

(Note: End point of all grades, not over 375° F.)

| | | | |
|---|---|---|---|
| **OKLAHOMA** | | | |
| Grade AA, 80-87.9, 375 E.P. | 9 - 9¼ | 9¼ - 9½ | 9½ 9¾ |
| Grade A, 72-79.9, 375 E.P. | 9 - 9¼ | 9¼ - 9½ | 9½ 9¾ |
| Grade BB, 84-90, 375 E.P. | - 8¾ | - 9 | 9¾ 9¼ |
| Grade B, 76-88.9, 375 E.P. | - 8¾ | - 9 | 9¾ 9¼ |
| Grade C, 80-90, 375 E.P. | - 8½ | 8¾ - 8⅞ | 9 - 9¾ |
| **NORTH LOUISIANA** | | | |
| *Grade Double A | 9½ - 9¾ | 9⅝ - 9¾ | -10 |
| *Grade Double B | - 9¼ | - 9½ | 9⅝ 9¾ |
| *Grade C | - 9 | - 9 | - 9¼ |
| *F. O. B. Monroe District. | | | |
| **NORTH TEXAS** | | | |
| *Grade Double A | 9 - 9¼ | 9¼ - 9½ | 9⅝ - 9¾ |
| *Grade A | 9 - 9¼ | 9¼ 9½ | 9⅝ - 9¾ |
| *Grade Double B | - 8¾ | - 9 | 9 - 9¼ |
| *Grade B | - 8¾ | - 9 | 9 - 9¼ |
| *Grade C | - 8½ | - 8¾ | 9 - 9¾ |
| *F. O. B. Breckenridge. | | | |
| **CALIFORNIA** | | | |
| 75-85° 375-390 E. P. | 11½-12 | 12 -12½ | 13½-14½ |
| **PENNSYLVANIA** | | | |
| 68-70 Grav. 437 E. P. | 13¼ 13½ | 13¼ 13½ | 13¼ 13½ |
| 64-66 Grav. 437 E. P. | 13½ 14 | 13½ 14 | 13½ 14 |
| 60-62 Grav. 437 E. P. | 13½ 14 | 13½ 14 | 13½ 14 |
| 68-70 Grav. 420 E. P. | 13½-14 | 13½-14 | 13½-14 |

## BURNING OILS

| | | | |
|---|---|---|---|
| **PENNSYLVANIA** | | | |
| 65 Water White Kerosene | 9¾ 9½ | 9¾ 10 | -10 |
| 66 Water White Kerosene | 10 10½ | 10 10½ | 10½-10¾ |
| 67 Water White Kerosene | 10½ 10¾ | 10½ 11 | 11 -11½ |
| **OKLAHOMA** | | | |
| 41-43 Water White Kerosene | 6¾ - 7 | 7 - 7½ | 7½- 7⅝ |
| 42-44 Water White Kerosene | 7¼ - 7½ | 7¾ - 8 | - 8 |
| **KANSAS** | | | |
| 41-43 w. w. kerosene | - 8 | 8¼ - 8½ | - 8¾ |
| 42-44 w. w. kerosene | - ⅞ | - 9 | - 9¼ |
| **NORTH TEXAS** | | | |
| 41-43 Water White Kerosene | 6¾ - 7 | 7 - 7¼ | - 7¼ |
| **NORTH LOUISIANA** | | | |
| 41-43 Water White Kerosene | 7½ - 7¾ | - 8 | - 8¼ |
| **ARKANSAS** | | | |
| 41-43 Water White Kerosene | - 7¼ | - 8¼ | - 8¼ |
| *Prices nominal | | | |

| | Prices Oct. 18 | Prices Oct. 11 | Prices Oct. 4 |
|---|---|---|---|
| **CALIFORNIA** | | | |
| 38-40 Water White Kerosene | 6¾ 7 | 7⅛ 8 | 7⅛ - 8 |
| **NEW ENGLAND** | | | |
| **40-43 Water White Kerosene | -11 | -11 | -11¾ |

## NEUTRAL OIL

| | | | |
|---|---|---|---|
| **PENNSYLVANIA** (Viscosity at 70° F.) | | | |
| 200 Vis. No. 3 Assoc. Filt | 28½ -29 | 28¾-29 | 28¾-29 |
| 180 Vis. No. 3 Assoc. Filt | 28 28½ | 28 -28¾ | 28 -28¾ |
| 150 Vis. No. 3 Assoc. Filt | 23½ 24 | 23½-24 | 23½-24 |
| (Non-Viscous) | | | |
| 54 Grav. 350-360 Flash | 7½ - 8 | 7½ - 8 | 7½ - 8 |
| 56 Miners Neutrals 300-305 Flash | 7½ - 7¾ | 7½ - 7¾ | 7 - 7½ |
| **OKLAHOMA** (Viscosity at 100° F.) | | | |
| 100 Vis. No. 2 color | 7 - 7½ | 7 - 7⅝ | 7 - 7⅝ |
| 150 Vis. No. 3 color | 9¾-10 | 9¾-10 | 9¾-10 |
| 150 Vis. No. 4 color | - 9¾ | - 9¾ | - 9¾ |
| 180 Vis. No. 3 color | 10 -11½ | 10 -11½ | 10 -11½ |
| 180 Vis. No. 4 color | 10 -10½ | 10 -10½ | 10 -10½ |
| 180 Vis. No. 5 color | 10 10¾ | 10 10¾ | 10 -10¾ |
| 200 Vis. No. 3 color | 10¾ 12½ | 10¾ 12½ | 11 -12½ |
| 200 Vis. No. 4 color | 11½ | 11½ | -11½ |
| 200 Vis. No. 5 color | 9¾-11½ | 9¾-11½ | 9¾-11½ |
| 220 Vis. No. 3 color | 12 -13½ | 12 -13½ | 12 -13½ |
| 220 Vis. No. 4 color | -13 | -13 | -13 |
| 220 Vis. No. 5 color | 12 -12¾ | 12 -12¾ | 12 -12¾ |
| 240 Vis. No. 3 color | 14 -15 | 14 -15 | 14 -15 |
| 240 Vis. No. 4 color | -14½ | -14½ | -14½ |
| 240 Vis. No. 5 color | 13 -14 | 13 -14 | 13 -14 |
| 280 Vis. No. 3 color | 16 -17 | 16 -17 | 16 -17 |
| 280 Vis. No. 4 color | -16½ | -16½ | -16½ |
| 280 Vis. No. 5 color | 15 -16 | 15 -16 | 15 -16 |
| 300 Vis. No. 5-6 color | -17 | -17 | -17 |
| **GULF COASTAL** (Viscosity at 100° F; cold test 0) | | | |
| 100 Vis. No. 2 Color Unfilt. Pale | 8½- 9 | 8½- 9 | 8½- 9 |
| 200 Vis. No. 3 Color Unfilt. Pale | 11½ 12 | 11½ 12 | 11½ 12 |
| 300 Vis. No. 3 Color Unfilt. Pale | 12½ 13 | 12½ 13 | 12¾ 13 |
| 500 Vis. No. 3½ Color Unfilt. Pale | 14 14½ | 14 -14½ | 14 14½ |
| 750 Vis. No. 4 Color Unfilt. Pale | 17½ 18 | 17½ 18 | 17½ 18 |
| 200 Vis. No. 5½ Color Red Oil | 10 10½ | 10 10½ | 10 -10½ |
| 300 Vis. No. 5½ Color Red Oil | 11½ 12 | 11½ 12 | 11¾ 12 |
| 500 Vis. No. 6 Color Red Oil | 12½ 13 | 12½ 13 | 12¾ 13 |
| 750 Vis. No. 6 Color Red Oil | 16 -17 | 16 -17 | 16 -17 |
| **CALIFORNIA** (Viscosity at 100° F.) | | | |
| 100 Vis. No. 2 color | 9½-10 | 9½-10 | 11 -11½ |
| 100 Vis. No. 3 color | 8 - 8½ | 8 - 8½ | 8½- 9 |
| 200 Vis. No. 3 color | 10 -10½ | 10 -10½ | 13½-14 |
| 300 Vis. No. 3 color | 11 -11½ | 11 -11½ | 15 -15½ |
| 450 Vis. No. 3½ color | 13 -13½ | 13 -13½ | 18 -18½ |
| 550 Vis. No. 3½ color | 15 -15½ | 15 -15½ | 20 -21 |
| 600 Vis. No. 3½ color | 15½-16 | 15½-16 | 21 -22 |
| 100 Vis. No 5 color | 7 - 7½ | 7 - 7½ | 7 - 7½ |
| 200 Vis. No. 5 color | 9 - 9½ | 9 - 9½ | 12 -12½ |
| 300 Vis. No. 5 color | 9½-10 | 9½-10 | 13 -13½ |
| 400 Vis. No. 6 color | 11½-12 | 11½-12 | 15 -16 |
| 500 Vis. No. 6 color | 12 -12½ | 12 -12½ | 16 -17 |
| 600 Vis. No. 6 color | 12½-13 | 12½-13 | 17 -18 |
| 700 Vis. No. 7 color | 14½-15 | 14½-15 | 18 -19 |

## CYLINDER STOCKS

| | | | |
|---|---|---|---|
| **OKLAHOMA** | | | |
| 190-200 Vis. at 210° Bright Stock | 31 -35 | 31 -35 | 31 -35 |
| 150-160 Vis. at 210° Bright Stock | 27 -31 | 27 -31 | 27 -31 |
| 600 E Stock, 140-150 Vis. - 210° | 18 -20 | 18 -20 | 18 -20 |
| 600 Steam Refined Olive Green | 8 -11 | 8 -11 | 8 -11 |
| 600 Steam Refined Dark Green | 6 - 8 | 6 - 8 | 6 - 8 |
| Black Oil | 5 - 6 | 5 - 6 | 5 - 6 |
| **PENNSYLVANIA** (1-inch Immersion Test) | | | |
| 600 Steam Refined | 11½ 12 | 11½-12 | 12¾-13 |
| 650 Steam Refined | -16 | 16 | 16 -18 |
| 600 Flash | 21 -21½ | 21 -21½ | 21½-22 |
| 625 Flash | -31 | 31½ 32 | 31½-32 |
| 600 Warren E | 20½ 21 | 20½-21 | -21 |
| 600 Oil City E | 19½-20 | 19½ 20 | -20 |
| 600 D Filtered | 26½ 27 | 26 26½ | 26 -26¾ |
| Cold Test Stocks (bright filtered) | -41 | -41 | 41 -41½ |
| Cold Test Stock (dark filtered) | -39 | -39 | 39 -39½ |

## LONG RESIDUUM STOCKS

| | | | |
|---|---|---|---|
| **PENNSYLVANIA** | | | |
| 45-50 vis @ 210, 420-425 flash | -31 | -31 | -32 |
| 50-55 vis @ 210, 430-435 flash | -32 | -32 | -33 |
| 60-65 vis @ 210, 440-450 flash | -33 | -33 | -34 |
| 70-75 vis @ 210, 450-455 flash | -34 | -34 | -35 |
| 75-80 vis @ 210, 440-470 flash | -35 | -35 | -35 |
| 80-85 vis @ 210, 440-450 flash | -35 | -35 | -35 |
| 80-85 vis @ 210, 450-460 flash | -36 | -36 | -36½ |
| 80-85 vis @ 210, 460-465 flash | -37 | -37 | -37 |
| 95-100 vis @ 210, 490-495 flash | -38 | -38 | -39 |

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon higher.)

**Only one refiner quoting.

Guaranteed
100% PURE
PENNSYLVANIA
OIL
TRADE MARK

# BLENDED to *your* SPECIFICATIONS

*from*

## 450 Bright Stock (Sharples Process) and 100% Pennsylvania Crude Neutrals

**Available for immediate shipment in tank cars, compartment tank cars, barrels, drums, or packed in your individual containers. For quotation, write to**

## The FREEDOM OIL Works Company, Freedom, Pa.

*Refiners of Pennsylvania Grade Crude for 47 years.*

*Refineries at* Freedom and Coraopolis

**Freedom Quality Stocks**
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600 Steam Refined
635 Steam Refined
650 Steam Refined

**Freedom Filtered Neutrals**
**Freedom 300 Mineral Seal Oil made to Railroad Specifications**
**Freedom Filtered Burning Oils**

# FREEDOM

# Refinery Markets on Wax and Heavy Oil Products

Pennsylvania, Oklahoma, Kansas, North and South Texas, Louisiana, Arkansas, California and New England

## WAX

| PENNSYLVANIA | Prices Oct. 18 | Prices Oct. 11 | Price Oct. 4 |
|---|---|---|---|
| | (Per Pound, New York) | | |
| 122-124 White Crude Scale | 5 – 5⅛ | – 5¼ | – 5¼ |
| 124-126 White Crude Scale. | 5⅛– 5¼ | – 5⅜ | – 5⅜ |
| **OKLAHOMA** | | | |
| 124-126 White Crude Scale. | 4⅜– 4¾ | 4⅜ –4¾ | 4⅜– 4¾ |
| **CALIFORNIA** | | | |
| White Crude Scale..... | 6 – 7 | 6 – 7 | 6 – 7 |

## FUEL OIL

| | | | |
|---|---|---|---|
| **PENNSYLVANIA** | | | |
| 36-40 Fuel Oil..... | 6⅜– 6⅝ | 6¼– 6½ | 6¼–6½ |
| 30-34 Gas Oil..... | 5¾– 6 | 5⅞– 6 | 5⅞– 6 |
| 28-30 Fuel Oil..... | 5¾– 6 | 5¾– 6 | 5¾– 6 |
| **OKLAHOMA** | | | |
| 38-40 Straw distillate..... | 5⅝– 5⅞ | 5¾– 6 | 5⅝– 6 |
| 36-38 Straw distillate..... | 5⅜– 5⅝ | 5¼– 5¾ | 5½– 5⅝ |
| 32-36 Gas oil cracked (Gal.) | 4⅛– 4¼ | 4⅛– 4¼ | 4⅛– 4¼ |
| 32-36 Crude Gas oil,(Gal.) | 4¼– 4⅜ | 4¼– 4⅜ | 4¼– 4⅜ |
| 28-30 Fuel oil (Bbl.)..... | 1.5 –1.60 | 1.22½–1.25 | 1.25 –1.30 |
| 14-16 Fuel oil (Bbl.)..... | 1.22½–1.25 | 1.25 –1.27½ | 1.25 –1.30 |
| 16-18 Fuel oil (Bbl.)..... | 1.25 –1.27½ | 1.27½–1.30 | 1.27½–1.32½ |
| 18-22 Fuel oil (Bbl.)..... | 1.25 –1.30 | 1.30 –1.35 | 1.30 –1.35 |
| 22-26 Fuel oil (Bbl.)..... | 1.30 –1.35 | 1.35 –1.40 | 1.37½–1.42½ |
| 24-26 Fuel oil (Bbl.)..... | 1.35 –1.40 | 1.40 –1.50 | 1.47½–1.55 |
| 26-28 Fuel oil (Bbl.)..... | 1.40 –1.50 | 1.50 –1.60 | 1.55 –1.60 |
| **KANSAS*** | | | |
| 38-40 Light straw distillate. | 5⅞– 6 | 5⅞– 6 | 5⅞– 6 |
| 36-38 Light straw distillate. | 5¾– 5⅞ | 5¾– 5⅞ | 5¾– 5⅞ |
| 32-36 Gas Oil..... | 4½– 4¾ | 4½– 4¾ | 4½– 4⅝ |
| 18-22 Fuel Oil..... | 1.35 –1.40 | 1.35 –1.40 | 1.35 –1.40 |
| 24-26 Fuel Oil..... | 1.50 –1.60 | 1.50 –1.60 | 1.45 –1.55 |
| *F. O. B. refinery, Kansas destination. | | | |
| **NORTH TEXAS** | | | |
| 38-40 Straw Distillate..... | 5¼– 5½ | 5¼– 5½ | 5¼– 5½ |
| 32-36 Gas Oil (Gal.) cracked | 4 – 4⅛ | 4 – 4¼ | 4 – 4¼ |
| 32-36 uncracked gas oil.... | 4⅛– 4⅜ | 4⅛– 4⅜ | 4⅛– 4⅜ |
| 24-26 Fuel per (Bbl.)..... | 1.47½–1.50 | 1.45 –1.50 | 1.40 –1.50 |
| **GULF COASTAL** | | | |
| Fuel..... | 1.55 –1.60 | 1.55 –1.60 | 1.55 –1.60 |
| Gas Oil..... | 5½– 5⅝ | 5½– 5⅝ | 5½– 5⅝ |

| NORTH LOUISIANA | Prices Oct. 18 | Prices Oct. 11 | Prices Oct. 4 |
|---|---|---|---|
| 32-36 Gas oil, cracked(Gal.) | 4⅛– 4⅜ | 4⅛– 4⅜ | 4⅛– 4⅜ |
| 32-36 Gas oil,uncracked(Gal.) | 4⅜– 4½ | 4½– 4⅝ | 4⅜– 4½ |
| 16-20 Fuel Oil (Bbl.)..... | 1.20 –1.30 | 1.20 –1.30 | –1.30 |
| **ARKANSAS** | | | |
| 30-34 Gas oil..... | 4 – 4¼ | 4⅛– 4¼ | 4⅛– 4¼ |
| 32-36 Gas oil..... | 4¼– 4½ | – 4½ | 4¼– 4½ |
| Smackover Crude Fuel.... | 1.27½–1.30 | 1.27½–1.30 | 1.25 –1.30 |
| Road oil..... | 1.26 –1.30 | 1.26 –1.30 | 1.26 –1.30 |
| **CALIFORNIA*** | | | |
| 14-18 Fuel Oil (Bbl.)..... | 85 –1.00 | 85 –1.00 | 1.00 |
| 14-18 Bunker Oil (Bbl.)... | 85 –1.00 | 85 –1.00 | 1.00 |
| 30-34 Gas Oil (Bbl.)..... | –1.40 | 1.00 –1.15 | 1.15 |
| 27 + Diesel Oil (Bbl.).... | –1.15 | 1.00 –1.15 | 1.15 |
| *(San Joaquin Valley, San Francisco 4c per bbl. more.) | | | |
| **NEW ENGLAND** | | | |
| | (F. O. B. Boston and Fall River) | | |
| 30-32 Gas Oil (Gal.)..... | – 6⅛ | – 6 | 6 – 6⅛ |
| Fuel Oil (Bunker C) Bbl.. | –1.75 | –1.72 | –1.80 |

## PETROLATUMS

| PENNSYLVANIA | | | |
|---|---|---|---|
| Snow White..... | 8½– 9 | 8½– 9 | 8½– 9 |
| Lily White..... | 7½– 8 | 7½– 8 | 7½– 8 |
| Cream White..... | – 6½ | – 6½ | – 6½ |
| Light Amber..... | – 3½ | – 3½ | – 3½ |
| Amber..... | 3¼– 3½ | 3¼– 3½ | 3¼– 3½ |
| Red..... | – 3 | – 3 | – 3 |
| Green —5..... | 1¾– 2 | 1¾– 2 | 1¾– 2 |

## PETROLEUM COKE

(Per ton in car lots)

| | | |
|---|---|---|
| Lump..... | $5–$6 | $5–$6 |
| Breeze..... | 2–2.25 | 2–2.25 |
| Still Run..... | 3.25–3.50 | 3.25–3.50 |

Above prices are f. o. b. refinery in tank car. They are the prices at which the bulk of the products on the open market move. Whoever has knowledge of any open market prices on any considerable quantity of goods differing from the foregoing, will favor us with this information.

(Continued from page 121)

Kansas City marketer said this week that 45,000 barrels had been offered him, but he had been unable to place it.

* * *

WICHITA FALLS, Oct. 18.—Refiners in north Texas who are operating apparently have put themselves in a good position for the remainder of October. A few of the smaller plants have closed and one or two others are reported to be preparing to close within a short time. Other plants have reduced crude runs and have sold most of their output for over the month, causing a considerably better spot market.

The demand for higher gravity gasolines has been so good that one or two refiners have quit making U. S. Motor and now are cutting 60-62 400 e. p., 64-66 375 e. p. and 68-70 350-360 e. p. grades.

Little 41-43 w. w. kerosene is available here, although considerable 40-42 gravity oil is being offered. Fuel oils are virtually sold up, large rail and industrial users having placed orders around Oct. 1 for most of the month's production.

---

New York City.—After a strenuous and successful summer, the "Sinclair Boosters" of New York will enjoy their first dinner and dance of the season at the Greenwich Village Inn on Oct. 19.

## Mere Holes in Ground Subject of Warning

WASHINGTON, Oct 18.—Disaster awaits the holder of a permit to prospect public land for oil or gas who hopes to hold his permit by using a miniature drilling outfit such as can be and is successfully used in drilling for water. The fact that such an outfit has been used may be reason of itself for revoking a permit.

That's the substance of a warning First Assistant Secretary Finney of the Department of the Interior, who is in direct charge of the administration of the national leasing law, has issued to permittees. Such outfits have been suggested as opening the doors to unlimited opportunities in validating government leases in the Rocky mountain area at low cost. Mr. Finney says such validation holes will not do. An idea that such drilling will serve to validate the permit, Mr. Finney says displays a misconception of the purpose of the mineral leasing law that seems to be shared by many permittees and others interested in one way or another in oil and gas operations.

In a statement on the subject Mr. Finney said:

"The principal permit requirements with respect to drilling, expanded in the light of the operating regulations, are as follows:

"1. To install a drilling outfit adequate for drilling to the objective horizon and to begin actual drilling within six months, all under a plan submitted to and approved in advance by a representative of the Secretary. To receive approval the drilling plan must provide for a hole of such size, not less than six inches, that the objective horizon may be reached effectively; and must include a program of casing, cementing, mudding, and other operations such that all minerals not to be produced will be protected from gas or fluid, and that oil or gas to be produced may be recovered effectively and with a minimum of contamination. The drilling plan shall be set forth on a "notice of intention to drill" which shall be submitted to the appropriate supervisor, oil and gas operations, Geological Survey, and receive his approval before drilling is commenced.

"2. To drill at least one well to a depth of at least 500 feet under the approved drilling plan within a period of a year.

"3. To drill at least one well to a depth of at least 2,000 feet under the approved drilling plan within a period of two years.

"It should be clearly understood that unapproved drilling is no drilling at all under the terms of the permit and that the 500 feet of hole to be made in the first year must be a 500-foot beginning on a well adequately planned."

Market Section

# Buying of High Test Gasolines Increased in Chicago Market

Staff Special

CHICAGO, Oct. 16

HIGH test gasolines showed the greatest increase in activity this week in the Chicago resale market. U S. Motor gasoline and kerosene had no material changes while the burning oil demand fell a little.

There was an increase in demand for high test gasolines in the middle of the week and the commodity retained strength through the close of business today. One marketer today said he believed prices of high test gasolines had reached bottom and that he was pushing them among his customers. The price of 64-66, 375 e.p. gasoline was firm over the week at 11⅛ to 11¼ cents. While some sales of 60-62, 400 e.p. goods were made at 11 cents on Monday and 10⅞ cents on Tuesday the dominant price was 10¾ cents.

Movement of 58-60 U. S. Motor gasoline continued to be for immediate requirements. The buying flurry which set in Oct. 9 continued over the fore part of this week, but had subsided by Wednesday. The trade agreed there was no let-up of the hand-to-mouth buying policy while jobbers continued to expect a tankwagon price reduction.

Several paradoxical situations were noted this week in U. S. Motor gasoline demand. A refiner today reported that while buying was relatively quiet this week he had a larger volume of sales than last week. One marketer, who has not been pushing sales, said that he received a few orders by mail Monday and Thursday.

Price of U. S. Motor gasoline continued to ease off. Monday and Tuesday the market was 10 to 10¼ cents. The top price had fallen to 10⅛ cents by Wednesday. The market settled to 10 cents flat Thursday and was 9⅞ to 10 cents today. Several factors today reported that they were quoting 9¾ cents on inquiries for any considerable volume of goods. Reports were current through the week that Motor gasoline from Oklahoma was moving to the trade at 9¾ cents.

The Independent oil jobbers in South Dakota reduced price of gasoline at tank wagon and service stations throughout the state 1 cent this morning. There was no reaction in the Chicago market.

Kerosene demand passed through a 1-cent reduction by the Standard Oil Co. of Indiana throughout the territory on Oct. 15 without effect. Sales of the commodity have been scarce all week. The price of 41-43 water white kerosene was firm at 7¼ cents until announcement of the reduction Tuesday noon, with some sales at 7½ cents. The market was disrupted Tuesday afternoon and Wednesday with quotations ranging from 6¾ to 7¼ cents. From Thursday on 41-43 w.w. sold for 7 cents while quotations were from 7 to 7¼ cents. The 42-44 w.w. grade remained at 7¾ cents all week.

Demand for heavier burning oils slackened. The trade reported weather conditions have been unfavorable for sales of these oils.

Distillate, 38-40 straw color, sold for 5¾ to 6 cents a gallon through the week with 5¾ cents as the price in most sales. The 36-38 distillate was 5½ to 5¾ cents early this week, but the price eased off to 5½ to 5⅝ cents on Thursday. Dark gas oil was firm at 4⅛ to 4¼ cents, and straw color gas oil was 4⅜ to 4½ cents.

The $1.30 to $1.35 a barrel price on 18-22 fuel oil held for the first part of the week but went to $1.27½ to $1.32½ on Wednesday, and to $1.27½ to $1.30 today. A similar reduction was noted in 24-26 grade which fell from $1.37½ to $1.42½ Monday to $1.37½ to $1.40 by mid-week and remained at that figure today. Smackover was unchanged at $1.27½ to $1.30, with a few sales above and below that range.


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*Petroleum Markets-Every Day*

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**CHICAGO—360 N. Michigan Ave.**
**CLEVELAND—866 Caxton Bldg.**


## Tank Wagon Markets Week's Price Changes

### Gasoline Changes

**Standard of New York**—T.w. and s.s. gasoline cut 2 cents, Buffalo, to 18 cents and 21 cents respectively, **Oct. 14.**

**Atlantic Refining**—T.w. and s.s. gasoline reduced 1 cent, Pennsylvania and Delaware, **Oct. 12.**

**Standard of Kentucky**—T.w. and s.s. prices gasoline reduced 1 cent generally, in Kentucky, excepting Louisville and Lexington unchanged, **Oct. 12.** T.w. and s.s. gasoline reduced 1 cent generally rest of territory, **Oct. 13.**

**Standard of Indiana**—See separate story on this page for gasoline changes at Sioux City, Ia., Grand Forks, N. D., and St. Joseph, Mo.

**Standard of Nebraska**—T.w. and s.s. gasoline cut 2¾ cents, Norfolk, to 19 cents and 21 cents, **Sept. 3.** Prices at this point have been in error in National Petroleum News since that date.

**Magnolia Petroleum**—T.w. and s.s. gasoline reduced 2 cents, Tulsa, to 18 cents and 21 cents respectively, **Oct. 2.**

### Kerosene Changes

**Standard of Indiana** — Kerosene reduced 1 cent, through territory, **Oct. 13.**

**Standard of Nebraska**—Kerosene cut 1 cent, through Nebraska, **Oct. 13.**

**Magnolia Petroleum** — Kerosene reduced 1 cent, Arkansas, **Oct. 7.** Kerosene advanced 2 cents, Muskogee, to 15 cents at tank wagon, **Oct. 5.**

**Magnolia Petroleum**—Kerosene cut 2 cents, Oklahoma, to 13 cent level generally. **Oct. 14.**

**Standard of Kentucky**—Kerosene reduced 1 cent generally, in Kentucky, excepting Louisville, **Oct. 12,** and 1 cent generally in rest of territory, **Oct. 13.**

**Continental Oil**—Kerosene reduced 1 cent, Colorado, Wyoming and Utah, and ½ to 2 cents, Idaho and New Mexico, **Oct. 18.** Boise and Twin Falls, Idaho, were cut 1 cent and Albuquerque, 1½ cents. Montana kerosene was unchanged.

## S. O. N. J. Is Winner In Freight Rate Case

WASHINGTON, Oct. 18.—The Supreme Court of the United States today refused to review the decision of the federal courts in North Carolina in the cases of The Atlantic Coast Line and Seaboard Air Line against the Standard of New Jersey.

The lower courts held, that notwithstanding the fact that gasoline and other petroleum products brought to the Wilmington, N. C., bulk station of the Standard, the company was entitled to move to points in North Carolina on North Carolina freight rates which were lower than the interstate rates.

The courts held that the petroleum products, when they were put into the bulk station lost their interstate character, which they had while they were being transported to Wilmington in tank ships because The Standard had no idea of where they would be sent from Wilmington, although it knew they would not be kept there.

# Tank Wagon, Service Station Markets for Gasoline and Kerosene In United States Territories and Canada

**These Prices in Effect Oct. 18, 1926**

## S. O. NEW JERSEY TERRITORY

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Atlantic City, N. J. | 19 | 0 | 19 | * | 16 |
| Newark, N. J | 19 | 0 | 19 | 21 | 16 |
| Annapolis, Md. | 19 | 2 | 21 | * | 16 |
| Baltimore, Md. | 19 | 2 | 21 | 24 | 16 |
| Cumberland, Md. | 19 | 2 | 21 | 24 | 16 |
| Washington, D. C. | 19 | 2 | 21 | 24 | 16 |
| Danville, Va. | 19 | 4½ | 23.5 | * | 16 |
| Norfolk, Va. | 19 | 4½ | 23.5 | 26.5 | 16 |
| Richmond, Va. | 19 | 4½ | 23.5 | 26 5 | 16 |
| Roanoke, Va. | 19 | 4½ | 23.5 | 26.5 | 16 |
| Petersburg, Va. | 19 | 4½ | 23.5 | * | 16 |
| Williamsburg, Va. | 19 | 4½ | 23.5 | * | 16 |
| Charleston, W. Va. | 18 | 3½ | 21.5 | 24.5 | 16 |
| Clarksburg W Va. | 19 | 3½ | 22.5 | 25.5 | 16 |
| Keyser, W. Va. | 19 | 3½ | 22.5 | * | 16 |
| Parkersburg, W. Va. | 18 | 3½ | 21.5 | 24.5 | 16 |
| Wheeling, W. Va. | 18 | 3½ | 21.5 | 24.5 | 16 |
| Charlotte, N C | 19.5 | 4 | 23.5 | 26.5 | 16 |
| Hickory, N. C. | 19.5 | 4 | 23.5 | * | 16 |
| High Point, N. C. | 19.5 | 4 | 23.5 | * | 16 |
| Mt. Airy, N. C. | 19.5 | 4 | 23.5 | * | 16 |
| Salisbury, N. C. | 19.5 | 4 | 23.5 | * | 16 |
| Charleston, S. C. | 19.5 | 5 | 24.5 | 27.5 | 16 |
| Columbia, S. C. | 19.5 | 5 | 24.5 | 27.5 | 16 |

*Dealers set own prices. S. O. New Jersey does not operate station.

## S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

| | | | | | |
|---|---|---|---|---|---|
| *New York City | 21 | 0 | 21 | 25 | 18 |
| Albany, N. Y. | 17 | 0 | 17 | 19 | 18 |
| Buffalo N Y | 18 | 0 | 18 | 21 | 18 |
| Rochester, N. Y. | 20 | 0 | 20 | 24 | 16 |
| Syracuse, N Y. | 17 | 0 | 17 | 19 | 18 |
| Boston, Mass. | 19 | 0 | 19 | 21 | 18 |
| Augusta, Me | 21 | 3 | 24 | 26 | 18 |
| Manchester, N. H. | 21 | 2 | 23 | 25 | 18 |
| Burlington, Vt. | 21 | 2 | 23 | 25 | 18 |

*In steel barrels.

## ATLANTIC REFINING

| | | | | | |
|---|---|---|---|---|---|
| Pittsburgh, Pa. | 19 | 0 | 19 | *24 | 17 |
| Philadelphia Pa. | 19 | 0 | 19 | *24 | 17 |
| Allentown, Pa. | 19 | 0 | 19 | *24 | 17 |
| Erie, Pa. | †18 | 0 | 18 | *23 | 15 |
| Scranton Pa. | 19 | 0 | 19 | *24 | 17 |
| Altoona, Pa. | 19 | 0 | 19 | *24 | 17 |
| Dover Del | 19 | 2 | 21 | 24 | 17 |
| Wilmington, Del. | 19 | 2 | 21 | 24 | 17 |
| Providence, R. I. | 19 | 1 | 20 | 22 | 18 |
| Boston, Mass. | 19 | 0 | 19 | 21 | 18 |
| Springfield, Mass. | 19 | 0 | 19 | 21 | 18 |
| Worcester, Mass. | 19 | 0 | 19 | 21 | 18 |
| Hartford, Conn. | 19 | 2 | 21 | 24 | 17 |
| New Haven, Conn. | 19 | 2 | 21 | 24 | 18 |

*Contains 2 cent tax collected by retail dealer and paid by him directly to state.

†Most sales are being made at 17c at tank-wagon but 18c is nominal price.

## S. O. KENTUCKY

| | | | | | |
|---|---|---|---|---|---|
| Lexington, Ky. | 18 | 5 | 23 | 26 | 17 |
| Louisville, Ky | 17 | 5 | 22 | 25 | 17 |
| Covington, Ky. | 18 | 5 | 23 | 26 | 17 |
| Clarksdale, Miss. | 18 | 4 | 22 | 25 | 14 5 |
| Jackson, Miss. | 18 | 4 | 22 | 25 | 15.5 |
| Natchez, Miss. | 17 5 | 4 | 21.5 | 24 5 | 15 |
| Vicksburg, Miss. | 17.5 | 4 | 21.5 | 24 5 | 15 |
| Birmingham, Ala. | 19 | 2 | 21 | 24 | 17 5 |
| Mobile, Ala. | 18 | 2 | 20 | 23 | 16 |
| Montgomery, Ala* | 20 | 2 | 22 | 25 | 18.5 |
| Atlanta, Ga. | †20 | 3½ | 24 | 27 | 18 |
| Augusta, Ga. | †20 | 3½ | 24 | 27 | 18 |
| Macon, Ga. | †20 | 3½ | 24 | 27 | 18 |
| Savannah Ga. | †18 | 3½ | 22 | 24 | 16 |
| Jacksonville, Fla. | 18 | 4 | 22 | 25 | 16 |
| Miami, Fla | 20 | 4 | 24 | 27 | 17.5 |
| Tampa, Fla | 18 | 4 | 22 | 25 | 16 |
| Pensacola Fla. | 18 | 4 | 22 | 25 | 16 5 |

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

†Georgia has ½ cent per gal. inspection fee on gasoline which is deducted as well as the state gasoline road tax of 3½ cents, to get the actual net tank wagon market to dealer.

## S. O. INDIANA

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Chicago, Ill. | †19 | 0 | †19 | 21 | 14.5 |
| Decatur, Ill. | 19.2 | 0 | 19.2 | 21.2 | 15 |
| E. St. Louis, Ill. | 18.1 | 0 | 18.1 | 20.35 | 14.1 |
| Joliet, Ill. | 19.4 | 0 | 19.4 | 21.4 | 15.2 |
| Peoria, Ill. | 19.2 | 0 | 19.2 | 21.2 | 15 |
| Quincy, Ill. | 19.2 | 0 | 19.2 | 21.2 | 14 8 |
| Indianapolis, Ind. | 19.2 | 3 | 22.2 | 24.2 | 15.2 |
| Evansville, Ind. | 19 | 3 | 22 | 24 | 15 |
| South Bend, Ind. | 19.4 | 3 | 22.4 | 24.4 | 15.4 |
| Detroit, Mich. | 19.8 | 2 | 21 8 | 23 8 | 15 7 |
| Grand Rapids, Mich. | 19 7 | 2 | 21 7 | 23.7 | 15 6 |
| Saginaw, Mich. | 19.9 | 2 | 21.9 | 23.9 | 15 8 |
| Green Bay, Wis. | 18.6 | 2 | 20.6 | 22 6 | 15.3 |
| Madison Wis | 19.3 | 2 | 21 3 | 23 3 | 15 |
| Milwaukee, Wis. | 19 1 | 2 | 21 1 | 23 1 | 14 8 |
| La Crosse, Wis. | 20.2 | 2 | 22.2 | 24.2 | 15 9 |
| Minneapolis, Minn. | 20 2 | 2 | 22 2 | 24 2 | 16 1 |
| Duluth, Minn | 20 5 | 2 | 22 5 | 24 5 | 16 1 |
| Mankato, Minn | 20.1 | 2 | 22 1 | 24 1 | 15 9 |
| Des Moines, Iowa. | 19.5 | 2 | 21 5 | 23.5 | 15 4 |
| Davenport, Iowa. | 19 5 | 2 | 21 5 | 23 5 | 15.4 |
| Sioux City, owa. | 16.9 | 2 | 18 9 | 20 9 | 15 |
| Mason City, Ia. | 19.5 | 2 | 21 5 | 23.5 | 15.4 |
| St. Louis, Mo. | *18.6 | 2 | 20 6 | 22 9 | 14 5 |
| Kansas City, Mo. | ††19.9 | 2 | 21 9 | 23 9 | 13 8 |
| St Joseph, Mo. | ††19.5 | 2 | 21.5 | 23.5 | 14 4 |
| Fargo, N. D. | 21.9 | 2 | 23.9 | 25.9 | 18 1 |
| Grand Forks, N. D. | 20 | 2 | 22 | 24 | 18 4 |
| Minot, N. D. | 21.9 | 2 | 23.9 | 25.9 | 18 1 |
| Pierre, S. D. | 20 5 | 3 | 23.5 | 25.5 | 16 6 |
| Huron, S. D. | 20.5 | 3 | 23.5 | 25.5 | 16 6 |
| Wichita, Kans | **17 8 | 2 | 19 8 | 21.8 | 14.9 |
| Bar lesville, Okla. | 17.8 | 3 | 20 8 | 22 8 | 14 3 |

†Dumps of 100 or more gallons at 18c per gallon

*Includes city tax of ½c.

††Includes city tax of 1c.

**Dumps of 50 gallons or more in Kansas, 1c discount per gallon.

## S. O. NEBRASKA

| | | | | | |
|---|---|---|---|---|---|
| Crawford, Neb. | 20 | 2 | 22 | * | 15 75 |
| Omaha, Neb. | 19 25 | 2 | 21 25 | 23.25 | 15 |
| McCook | 20 75 | 2 | 22.75 | 24.75 | 16 5 |
| Norfolk | 17 | 2 | 19 | 21 | 15 5 |
| North Platte | 20.75 | 2 | 22 75 | 24 75 | 16 25 |
| Scottsbluff | 20.25 | 2 | 22.25 | 24.25 | 15.75 |

*Standard has no service station here.

## CONTINENTAL OIL

| | | | | | |
|---|---|---|---|---|---|
| Denver, Colo. | 20 | 2 | 22 | 22 | 17 |
| Pueblo, Colo. | 20 | 2 | 22 | 24 | 17 |
| Grand Junction, Colo. | 24 | 2 | 26 | 28 | 21 |
| Casper, Wyo. | 20 | 2½ | 22 5 | 24 5 | 15.5 |
| Cheyenne, Wyo. | 21 | 2½ | 23.5 | 25.5 | 17 |
| Butte Mont. | 22 | 2 | 24 | 24 | 20 5 |
| Helena, Mont. | 24 | 2 | 26 | 28 | 20.5 |
| Salt Lake City, Utah. | 20.5 | 3½ | 24 | 26 | 18 |
| Boise, Ida. | 22 | 3 | 25 | 27 | 20 |
| Twin Falls, Ida. | 22 | 3 | 25 | 27 | 20 |
| Albuquerque, N. M. | 25.5 | 3 | 28.5 | 28.5 | 18.5 |

## S. O. CALIFORNIA

| | | | | | |
|---|---|---|---|---|---|
| Phoenix, Ariz. | 19 | 3 | 22 | 25 | 21.5 |
| Los Angeles, Cal. | 11 5 | 2 | 13 5 | 16 5 | 13 5 |
| Fresno, Cal. | 13 5 | 2 | 15.5 | 18.5 | 17 5 |
| San Francisco, Cal. | 13 | 2 | 15 | 18 | 15 5 |
| Reno, Nev | 16 5 | 4 | 20.5 | 23.5 | 19 |
| Portland, Ore. | 13 | 3 | 16 | 19 | 16.5 |
| Seattle, Wash. | 13 | 2 | 15 | 18 | 16 5 |
| Spokane, Wash. | 17 | 2 | 19 | 22 | 20.5 |
| Tacoma, Wash. | 13 | 2 | 15 | 18 | 16.5 |

## S. O. LOUISIANA

| | | | | | |
|---|---|---|---|---|---|
| Little Rock, Ark. | 18 | 4 | 22 | 25 | 16 |
| Alexandria, La. | 18 | 2 | 20 | 23 | 17 |
| Baton Rouge, La. | 17 | 2 | 19 | 22 | 15.5 |
| Lake Charles La. | 18.5 | 2 | 20 5 | 23 5 | 17 |
| New Orleans, La. | *18.5 | 2 | 20 5 | 23.5 | 16 |
| Shreveport, La | 17 | 2 | 19 | 22 | 16 |
| Lafayette, La. | 18 | 2 | 20 | 23 | 16 5 |
| Bristol Tenn. | 21 | 3 | 24 | 27 | 17 5 |
| Chattanooga, Tenn. | 20.5 | 3 | 23.5 | 26.5 | 17.5 |
| Knoxville, Tenn. | 20 5 | 3 | 23.5 | 26.5 | 18 |
| Nashville, Tenn. | 18 | 3 | 21 | 24 | 18 |
| Memphis, Tenn. | 17 | 3 | 20 | 23 | 17 |

*Includes 1c city tax on gasoline and kerosene.

## S. O. OHIO

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| All Ohio points | 20 | 2 | 22 | 24 | 17 |

## MAGNOLIA PETROLEUM

| | | | | | |
|---|---|---|---|---|---|
| Muskogee, Okla. | 17 | 3 | 20 | 23 | 13 |
| Oklahoma City | 15 | 3 | 18 | 21 | 13 |
| Tulsa, Okla. | 15 | 3 | 18 | 21 | 13 |
| Fort Smith, Ark. | 18 | 4 | 22 | 25 | 14.5 |
| Little Rock, Ark. | 18 | 4 | 22 | 25 | 14.5 |
| Texarkana, Ark. | 20 | 4 | *24 | *24 | 15 |
| Dallas, Tex. | 16 | 1 | **17 | 17 | 15 |
| El Paso, Tex. | 20 | 1 | **21 | 21 | 16 |
| Fort Worth, Tex. | 16 | 1 | **17 | 17 | 15 |
| Houston, Tex. | 20 | 1 | **21 | 21 | 15 |
| San Antonio, Tex. | 18 | 1 | **19 | 19 | 15 |

*Within city of Texarkana, Ark., the state tax on gasoline is 1c per gal. conforming with the Texas state tax. In Texarkana district outside of the city the 4c state tax applies.

**Magnolia is maintaining only one price schedule in Texas—its retail schedule. This is in keeping with its contract, effective May 5, which allows the dealer 3c off the retail price.

## V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changed)

| | Oleum Spirits | V.M.& P Naphtha | Cleaner Naphtha |
|---|---|---|---|
| Chicago | 21 | 23 | 21 |
| Detroit | 22.2 | 24 7 | 22.7 |
| Kansas City | 21.2 | 23 2 | 21.2 |
| Milwaukee | 21.2 | *25 7 | *23.7 |
| Minneapolis | *24.5 | *27 | *25 |
| St. Louis | 20.4 | 22.9 | 22.2 |
| New York | ... | 22 | .... |

*Includes 2c state tax.

# CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

### ONTARIO

| | Gasoline T.W. | Tax | Total T.W. | S.S. | Oil T.W. |
|---|---|---|---|---|---|
| Toronto | 26.5 | 3 | 29.5 | 33 | 24 |
| Ottawa | 26.5 | 3 | 29.5 | 33 | 24 |
| Cochrane | 31.5 | 3 | 34.5 | 40 | 29 |
| Ft. William | 28.5 | 3 | 31.5 | 36 | 26.5 |

### MANITOBA

| | | | | | |
|---|---|---|---|---|---|
| Winnipeg | 29.5 | 3 | 32.5 | 36 | 26.5 |

### SASKATCHEWAN

| | | | | | |
|---|---|---|---|---|---|
| Regina | 32.5 | 0 | 32.5 | 37 | 29.5 |

### ALBERTA

| | | | | | |
|---|---|---|---|---|---|
| Edmonton | 31.5 | 2 | 33.5 | 37 | 28.5 |
| Calgary | 29.5 | 2 | 31.5 | 35 | 26.5 |

### BRITISH COLUMBIA

| | | | | | |
|---|---|---|---|---|---|
| Vancouver | 23 | 3 | 26 | 30 | 23 |

### QUEBEC

| | | | | | |
|---|---|---|---|---|---|
| Montreal | 26.5 | 3 | 29.5 | 33 | 24 |
| Quebec City | 28.5 | 3 | 31.5 | 35 | 26 |
| Three Rivers | 28.5 | 3 | 31.5 | 35 | 26 |

### NEW BRUNSWICK

| | | | | | |
|---|---|---|---|---|---|
| St. John | 29.5 | 3 | 32.5 | 36 | 27 |
| Moncton | 29.5 | 3 | 32.5 | 36 | 27.5 |

### NOVA SCOTIA

| | | | | | |
|---|---|---|---|---|---|
| Halifax | 29.5 | 3 | 32.5 | 36 | 27 |
| Sydney | 31.5 | 3 | 34.5 | 37 | 27.5 |

### PRINCE EDWARD ISLAND

| | | | | | |
|---|---|---|---|---|---|
| Charlottetown | 29.5 | 3 | 32.5 | 36 | 27 |

Note: In districts surrounding these points 1c additional is added to city price.

Market Section

# Export Buyers Watch Market Closely But Purchase Only Sparingly

By Special Correspondent
NEW YORK, Oct. 18

EXPORT buyers were keeping in much closer touch with gasoline and kerosene, particularly the latter, during the past week. Only one confirmed bulk cargo sale was reported but negotiations are on for two more. Kerosene showed a steadier tone while gasoline was still easy. Bunker oil ruled quiet. Gas oil was weak while lubricants were barely steady.

Russian oil is still flooding many of the leading European markets. During the period Oct. 1, 1925 to August 31, 1926, the exports of oil from the Soviet Union broke all Russian records. Total exports were about 9,170,756 barrels compared with about 8,737,800 barrels for the corresponding period a year ago. The annual prewar exports approximated 6,300,000 barrels.

Production in the Soviet fields has set a record each month since the beginning of 1926. August production was 777,183 metric tons against 751,628 tons in July.

### *Export Gasoline—New York*

With gasoline tank wagon price slashing reported from various sections of the country, European buyers are content with sitting back awaiting developments. There was an inquiry from the United Kingdom for 45,000 barrels of gasoline and kerosene for November shipment but this is still pending. At New York harbor refineries U. S. Motor was offered freely at 12 cents a gallon.

A Japanese buyer has been inquiring for 30,000 cases of Motor and 64-66 gravity 375-end point gasoline but this has not developed as yet. A South American buyer is reported to have purchased 15,000 cases of U. S. Motor and 64-66 gravity 375 e.p. gasoline for nearby shipment from a leading Independent.

### *Export Gasoline—Gulf Ports*

A leading Independent refiner booked a cargo of 50,000 barrels of U. S. Motor at 11 cents; 64-66 gravity at 12¼ cents; prime white kerosene at 8¼ cents and water white at 9¼ cents for November shipment to France. One of the leading refiners was reported working on a similar inquiry also for November shipment.

At the close of the week U. S. Motor ranged from 11 to 11¼ cents a gallon; 60-62 gravity 400 e.p. 11½ cents; 61-63 gravity 390 e.p. 11¾ cents and 64-66 gavity 375 e.p. at 12¼ to 12⅜ cents a gallon. One of the big Independent refiners sold 30,000 cases of U. S. Motor and 64-66 gravity gasoline for November shipment to the Near East. On Saturday U. S. Motor in cases, cargo lots, was quoted at $2.10 per case while 64-66 gravity 375 e.p. was held at $2.30 a case.

### *Domestic Gasoline—New York*

The steady influx of California gasoline has tended to depress the local market and there were persistent rumors of price shading. U. S. Motor in tank cars at the local refineries, however, was still generally quoted at 12 cents a gallon and in tank cars delivered to the trade at 13 cents a gallon. Consumption is still large but jobbers are reluctant to buy in view of the weakened condition of the market. Although there have been numerous tank wagon reductions throughout the country no changes have been made locally. California gasoline in cargo lots can be laid down here at 11½ cents a gallon.

### *Domestic Gasoline—Gulf Ports*

Domestic demand for gasoline has shown a slight improvement the past few days. Leading refiners have reduced U. S. Motor to 11 cents a gallon at the refineries. Jobbing demand has been much more spasmodic, since the reduction. The cut in Standard Oil Co. of Kentucky gasoline prices have tended to discourage some buyers from purchasing. Stocks of gasoline are large but refiners do not anticipate any further reductions of consequence.

### *Export Kerosene—New York*

Export demand for kerosene has shown a marked improvement although mainly confined to small quantities. Kerosene in drums has been moving to the Near East in a steadier way and there have been two inquiries for bulk cargoes reported, although details have been withheld. Water white was held at 10¾ cents a gallon by local refineries and prime white at 10½ cents a gallon. Cased kerosene demand has shown a noted improvement and orders for from 2000 to 5000 cases are more numerous, most of these coming from Near Eastern buyers demanding nearby shipment.

### *Export Kerosene—Gulf Ports*

At the close of the week, 41-43 prime white kerosene was quoted at 8¼ cents a gallon while 43-45 water white was quoted at 9¼ cents and 44 water white at 9½ cents a gallon. Judging from the more numerous inquiries export buyers are keenly interested. A Scandinavian buyer was inquiring for 30,000 barrels of prime and water white for November shipment but this did not materialize.

Cased kerosene was steady and water white was quoted at $1.85 per case while prime white was quoted at $1.75 a case, in cargo lots. A Far Eastern buyer is reported to have purchased 20,000 cases of prime and water white from a leading Independent refiner for November shipment.

### *Domestic Kerosene*

New York harbor refiners reported a more active domestic demand for kerosene. Water white was quoted at 10¾ cents refinery and 11¾ cents a gallon in tank cars delivered to the trade. Prime white kerosene was held ¼ cent below water white. Jobbing demand is better, reflecting the increase in consumption. However, in view of the recent kerosene tank wagon reductions in other sections, local observers are looking for a cut here soon. In the Gulf section water white kerosene was offered at 9 cents a gallon at the refineries. Demand was slightly better than during the preceding week.

### *Lubricants—New York*

Export demand for lubricating oils lagged last week. Stocks at Eastern refineries are large and there appeared to be more disposition to shade prices in order to move supplies. However,

## Exports From Tampico District

| Company | August | Sept. |
|---|---|---|
| Transcontinental Petroleum Co., (Standard of New Jersey) | 1,256,824 | 978,351 |
| Pan American Eastern Oil Co. | 1,997,077 | 2,153,183 |
| Mexican Eagle Oil Co., (El Aguila) | 782,481 | 998,078 |
| Cia. Mexicana Holandesa "La Corona" | 380,981 | 743,982 |
| The Texas Co. of Mexico, S. A. | 158,200 | 179,262 |
| Mexican Gulf Oil Co. | 340,547 | 280,824 |
| Sinclair Mexican Companies | 655,114 | 407,221 |
| East Coast Oil Co. of Mexico, S. A., (Southern Pacific) | 78,352 | 48,964 |
| Panuco-Boston Oil Co. | ..... | ..... |
| Mexican Oil Products Co. | 14,936 | 31,010 |
| Empire Gas & Fuel Co. | 62,379 | ..... |
| La Espuela Oil Co. | ..... | 87,710 |
| Pierce Oil Corp. | 135,510 | 70,707 |
| Mexican Atlas Oil Co. | 33,449 | 47,747 |
| Moctezuma Terminal | ..... | 48,361 |
| Totals | 5,870,890 | 5,982,900 |

foreign buyers are operating very conservatively and are apparently buying for immediate requirements only. Pennsylvania cylinder oils were dull and weak with 600 s. r. unfiltered offered more freely at 19 cents a gallon, in barrels, New York.

### *Lubricants—Gulf Ports*

While domestic demand for zero cold test oils has been a little more active there has not been much improvement in the general situation. Reports of price shading are still heard. Export buyers are inquiring for larger quantities but still buying hand-to-mouth. Rumors of two cargo sales to the Continent were current but appeared without foundation.

### *Waxes—New York*

White crude scale wax was a shade easier. Local brokers report a dearth of export orders, and the bulk of the foreign business is apparently going to two of the leading Atlantic seaboard refiners. These factors have been meeting considerable competition with Polish waxes abroad and are finding it necessary to shade prices. This in turn has brought about an easier tone in the local market. White crude scale 122-124 A.m.p. was freely offered at 4.90 cents a pound. Domestic demand for white crude scale wax is lagging. Refined waxes also are dull.

### *Waxes—Gulf Ports*

The wax market has been very quiet. A little white crude scale wax is being moved out against old orders but foreign buyers have been scarce. Stocks are fairly large. Prices are easier. Domestic buyers are content with purchasing as needed. The Catholic countries have been purchasing sparingly but orders from France, Spain and South America are expected to show a marked improvement during the next few weeks.

White crude scale 124-126 A.m.p. was quoted at 4.80 cents a pound. Other grades were quoted as follows: 124-126 semi refined 5 cents; 123-125 fully refined 5⅝ cents; 125-127 fully refined 5¾ cents; 128-130 fully refined 5¾ cents; 130-132 fully refined 6 cents; 133-135 fully refined 6¼ cents and 135-137 fully refined 6⅝ cents.

### *Bunker Oil—New York*

Demand for Grade C bunker oil showed a noted improvement last week. Most of the buying was for domestic account. Foreign buyers have been showing a little interest in the local market. Stocks are moderate. Grade C at New York harbor refineries still ranges from $1.65 to $1.75 a barrel while the f.a.s. New York harbor price ranges from $1.71½ to $1.81½ a barrel. Diesel oil was steady but quiet at $2.50 a barrel.

### *Bunker Oil—Gulf Ports*

Conditions in the Gulf bunker oil markets have not undergone any changes the past few days. Bulk cargoes are reported available at $1.36 a barrel while for bunkering purposes the price is $1.60 a barrel. No export sales were reported although there is a heavy contract movement on. At Tampico heavy Panuco crude oil was nominal and no cargo offerings were reported.

# Complete Export Markets

## New York Export Market

| GASOLINE | Oct. 18 | Oct 11 |
|---|---|---|
| U. S. Motor Tank cars Ref | 12 | -12 |
| U. S. Motor cases | 27.40 | -27.90 |
| California grade U. S. Motor F. O. B. N. Y. Cargoes | 11½ | -11½ |
| **KEROSENE** | | |
| 43-45-100 W. W. Tank cars Ref. | 10¾ | -10¾ |
| 43-45-150 W. W. Cases | 19.65 | -19.65 |
| 42-44-110 S. W. Cases | 19.15 | -19.15 |
| **GAS OIL** | | |
| 36-40, Bulk Refinery | -06¾ | -06¾ |
| 28-34, Bulk Refinery | -06 | -06 |
| **MEXICAN BUNKER OIL** | | |
| Grade C, f. o. b. ref. Bulk | 1.65-1.75 | 1.65-1.75 |
| Diesel Oil f. o. b. ref. Bulk | -2.50 | -2.50 |

**LUBRICATING OILS**

The following prices are cooperage basis f. o. b. New York, products being manufactured by inland refineries.

**CYLINDER OILS (Bbls.)**

| 1 inch Immersion Test: All Penna. Products | |
|---|---|
| Filtered D 600 | -28 |
| Filtered E 600 | -27 |
| Unfiltered 600 s. r. | -19 |
| Unfiltered 650 s. r. | -25 |
| 600 flash s. r. | -27 |
| 650 Flash | -36 |

**RED PARAFFIN (Bbls.)**

(Viscosity at 70)

| | | |
|---|---|---|
| 300 vis. No. 5 color | -21 | -21 |
| 250 vis. No. 5 color | -20 | -20 |
| High Viscosity, No. 5 color | -25 | -25 |

**NEUTRAL OILS (Bbls.)**

(Viscosity at 70)

| | | |
|---|---|---|
| 200 vis. at Pale No. 3 color | -31 | -31 |
| 180 Pale No. 3 color | -29 | -29 |
| 150 Pale No. 3 color | -24½ | -24½ |

**BLACK OIL (Bbls.)**

| | |
|---|---|
| 25-30 cold test | -18½ |
| 15 cold test | -14½ |

**MEDICINAL OILS**

(Includes Price of Drums)
(Penna. Stocks)

| | Oct. 18 | Oct. 11 |
|---|---|---|
| Domestic 875-885 s. g. | - .85 | - 85 |
| Domestic 865-870 s. g. | .75- .80 | .75- 80 |
| Russian 885-890 s. g. 325-330 vis | 1.10-1.25 | 1.10-1.25 |

**WAXES**

(Penna. Stocks)
(F. A. S. Carload Lots)

| WHITE CRUDE SCALE | | |
|---|---|---|
| 122-124 A. m. p. | -4.90 | -4.90 |
| 124-126 A. m. p. | -.05 | -.05 |
| **MATCH** | | |
| 105-108 A. m. p. | -06 | -06 |
| **FULLY REFINED** | | |
| 120-122 A. m. p. | -05¾ | -05¾ |
| 123-125 A. m. p. Philadelphia | -05¾ | -05¾ |
| 125-127 A. m. p. | -05¾ | -05¾ |
| 128-130 A. m. p. | -06 | -06 |
| 130-132 A. m. p. | -06¼ | -06¼ |
| 133-135 A. m. p. | -06⅜ | -06⅜ |
| 135-137 A. m. p. | -06¾ | -06¾ |
| **YELLOW CRUDE SCALE** | | |
| 124-126 A. m. p. | -.0490 | -05 |

**PETROLATUMS**

(Penna. Stocks)
Per Pound

| | | |
|---|---|---|
| Dark Green | 02 | 02 |
| Veterinary | 02¾ | 02¾ |
| Light Amber | 03¾ | 03¾ |
| Dark Amber | 03½ | 03½ |
| Cream | 06 | 06 |
| Lily White | 07¾ | 07¾ |
| Snow White | 08¾-10 | 08¾-10 |

## Gulf Export Market

**GASOLINE**

F. O. B. Seaboard
(Shipments of 20,000 Bbls. and over)

| | Oct. 18 | Oct. 11 |
|---|---|---|
| U. S. Motor, Bulk | 11 -11¼ | - 11¼ |
| 60-62 400 e. p. Bulk | -11½ | - 11¾ |
| 61-63-390 e. p. Bulk | -11¾ | -.12 |
| 64-66-375 e. p. Bulk | -12¼ | -.12⅜ |
| U. S. Motor, Cases (cargo lots | 2.05 | 2.10 |
| 64-66 Cases (cargo lots) | 2.25 | 2.30 |
| **KEROSENE** | | |
| Water White, 43-45 bulk | 09½ | -09¼ |
| Prime White, 41-43 bulk | 08½ | -08 |
| Water White, cases (cargo lots) | 1.85 | 1.85 |
| Prime White, cases (cargo lots) | 1.75 | 1.75 |
| **DOMESTIC GAS AND BUNKER OIL** | | |
| 26-28, gravity, bulk* | 05¼ | -05¼ |
| 32 plus, bulk, Dark | 05¾ | -0 ¼ |
| Grade C Bunker oil | 1.60 | -1.60 |
| Cargoes | 1.36 | -1.35 |

*Transparent through neck of a 4 oz. bottle.

**MEXICAN CRUDE AND BUNKER OILS**

F. O. B. Steamer Tampico

| | | |
|---|---|---|
| Heavy, Taxes to be added | nominal | 1.15 |
| Grade C Bunker oil Taxes paid cargoes | nominal | nominal |
| Grade C Bunker oil F. O. B. Tampico, For Bunkering Purposes, taxes paid | 1.55 | -1.55 |

**SOUTH TEXAS**

(Viscosity at 100° F: cold test 0)
(Tanker, F. O. B. Houston)

| *LUBRICATING OILS | Oct. 18 | Oct. 11 |
|---|---|---|
| 100 Vis. No. 2 Unfiltered Pale | 07¾ | 07½ |
| 150 Vis. No. 2½ Unfiltered Pale | 10¼ | 09¼ |
| 200 Vis. No. 3 Unfiltered Pale | 11 | 10¼ |
| 300 Vis. No. 3 Unfiltered Pale | 12½ | 12½ |
| 500 Vis. No. 3½ Unfiltered Pale | 14 | 14 |
| 200 Vis. No. 5½ Red Oil | 10½ | 09¼ |
| 300 Vis. No. 5½ Red Oil | 11 | 10¼ |
| 500 Vis. No. 6 Red Oil | 13 | 11½ |
| 800 Vis. No. 6 Red Oil | 16¼ | 16 |

*These prices are entirely nominal owing to wide fluctuations

## Pacific Export Market

(Cargo lots quotations at seaboard, Los Angeles)

| | Oct. 18 | Oct. 11 |
|---|---|---|
| Gasoline, U. S. Motor— 51°-56° | 09 - 9¼ | 09 - 9¼ |
| Gasoline, U. S. Motor— blends and special cuts | 10 -10½ | 10 -10½ |
| Gas Oil 30°—34° B. per bbl | $1.35-1.40 | 1.00-1.15 |
| Diesel Oil, 27°B—plus per bbl | $1.00-1.15 | $1.15 |
| Bunker Oil, 14°—18°B. per bbl | $.85-1.00 | .85-1.00 |
| Fuel Oil, 14°—18°B. per bbl | $.85-1.00 | $1.00 |
| Kerosene, W. W. 38°—40° B per gal., 125-150 flash test | .08½ 06 | .05-.06 |
| **Cased Goods** | | |
| Gasoline, U. S. Motor | $2.25 | 2.00-2.25 |
| Kerosene, W. W. 38°—40° B per case, flash test 125-150 | $1.45-1.55 | $1.40 1.50 |

## N. Y. Domestic Market

The following light oil, gas and fuel oil prices are F. O. B. New York refineries, being products made from Domestic (including California) and Mexican Crudes

| | Oct. 18 | Oct. 11 |
|---|---|---|
| U. S. Motor Gasoline, Tank Cars Delivered greater N. Y. | -13 | 13-13¼ |
| U. S. Motor Gasoline, Tank Cars Bayonne | -12 | 12-12¼ |
| U. S. Motor Tank Cars, *Atlantic Seaboard Terminals | -12 | 12-12¼ |
| Kerosene, 44-150 W. W. Tank Cars del'd greater N. Y. | 11¾ | -11½ |
| Grade C Bunker f. o. b. N. Y. Ref | 1.65-1.75 | 1.65-1.75 |
| Diesel Oil f. o. b. Refinery | 2.50 | 2.50 |
| Gas Oil, 36-40, Bulk Refinery | -06¾ | -06¾ |
| Gas Oil, 28-34 Bulk, Refinery | 06 | -06 |

*New York, Philadelphia, Portsmouth, Va. Charleston, S. C.

# Crude Oil Prices, as Posted by Major

### EASTERN FIELDS
**Posted by Joseph Seep Purchasing Agency**

| | |
|---|---|
| Penna Grade Oil in New York Transit Lines (Allegheny N Y District) | $3 40 |
| Bradford District Oil in National Transit Lines (Bradford District) | 3 40 |
| Penna Grade Oil in National Transit Lines (Other Pennsylvania) | 3 30 |
| Penna Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania) | 3 30 |
| Penna Grade Oil in Eureka Pipe Lines (West Virginia) | 3.25 |
| Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district) | 3 05 |
| Keister Grade in National Transit Lines (Butler Co.) | 2 05 |
| Gaines Tioga Co. (Pa.) | 2 85 |
| Cabell Grade in Eureka Pipe Lines (West Virginia) | 2.40 |
| Corning Grade in Buckeye Pipe Lines (Ohio) | 2.55 |
| *Somerset Medium in Cumberland Pipe Lines (Kentucky) | 2.50 |
| *Somerset Light in Cumberland Pipe Lines (Kentucky) | 2.65 |
| Ragland Grade in Cumberland Pipe Lines (Kentucky) | 1 25 |

*Somerset oil run prior to Oct. 1, 1925, takes price of 6 cents lower than above quotations

**Posted by Stoll Oil Refining Co.**

| | |
|---|---|
| Tinsley Bottom, Tenn. oil in Stoll lines | $2 46 |
| Oil City, Ky. oil in Stoll lines | 2.65 |

### CENTRAL STATES FIELDS
**Posted by Ohio Oil Co.**

| | | | |
|---|---|---|---|
| Wooster | $2 55 | Illinois | $2.37 |
| Lima | 2 48 | Plymouth | 1 90 |
| Waterloo | 1 85 | *Canadian Petrolia | 2.88 |
| Indiana | 2 25 | *Posted by Imperial Oil Ltd. | |
| Princeton | 2.37 | | |

### OKLAHOMA, KANSAS And NORTH TEXAS
**Prices of Prairie Oil & Gas Co.**
**(In Oklahoma, Kansas, North and East Central Texas) Effective May 15, 1926.**

| | | | |
|---|---|---|---|
| 28-28.9 | $1 65 | 34-34.9 | $2 13 |
| 29-29.9 | 1 73 | 35-35.9 | 2 21 |
| 30-30.9 | 1 81 | 36-36.9 | 2 29 |
| 31-31.9 | 1 89 | 37-37.9 | 2 37 |
| 32-32.9 | 1 97 | 38-38.9 | 2 45 |
| 33-33.9 | 2.05 | 39-39.9 | 2.53 |
| 40-40.9 | $2.61 | 47-47.9 | $3 17 |
| 41-41.9 | 2 69 | 48-48.9 | 3 25 |
| 42-42.9 | 2 77 | 49-49.9 | 3 33 |
| 43-43.9 | 2.85 | 50-50.9 | 3 41 |
| 44-44.9 | 2 93 | 51-51.9 | 3 49 |
| 45-45.9 | 3 01 | 52 and above | 3 57 |
| 46-46.9 | 3 09 | | |

The Texas Co. posted same gravity and price as Prairie.

**Humble Oil & Refining Co. Prices**
**(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)**

Humble's grades and prices same as Prairie schedule. In fields where Humble purchases crude below 28°, 8 cents less for each full degree.

| | |
|---|---|
| Mirando, Tex | $1.25 |

**Magnolia Petroleum Co. Prices**
**In Oklahoma, Kansas and North and East Central Texas**

Same grades and prices as posted by Prairie, excepting that Magnolia is paying $1.30 for all oil below 28 gravity.

| | |
|---|---|
| Corsicana heavy | $1.25 |

### PANHANDLE, TEXAS
**Humble Oil & Refining Co.**

| | |
|---|---|
| Hutchinson and Carson Counties | $1.25 |

Other Fields, effective June 21:

| | | | |
|---|---|---|---|
| 28-28.9 | $1 35 | 37-37.9 | $1 80 |
| 29-29.9 | 1 40 | 38-38.9 | 1 85 |
| 30-30.9 | 1 45 | 39-39.9 | 1 90 |
| 31-31.9 | 1 50 | 40-40.9 | 1 95 |
| 32-32.9 | 1 55 | 41-41.9 | 2 00 |
| 33-33.9 | 1 60 | 42-42.9 | 2 05 |
| 34-34.9 | 1 65 | 43-43.9 | 2 10 |
| 35-35.9 | 1 70 | 44 and above | 2 15 |
| 36-36.9 | 1 75 | | |

Magnolia Petroleum Co. posted flat price of $1.25 for Hutchinson and Carson Counties on Sept. 22, and Kay County Gas Co. on Oct. 4.

### HURDLE DISTRICT, TEXAS
**(Crane and Upton Counties)**
**Kay County Gas Co.**

| | | | |
|---|---|---|---|
| Below 26 | $ .80 | 31-31.9 | $1.10 |
| 26-26.9 | .85 | 32-32.9 | 1 15 |
| 27-27.9 | .90 | 33-33.9 | 1 20 |
| 28-28.9 | .95 | 34-34.9 | 1 25 |
| 29-29.9 | 1.00 | 35-35.9 | 1 30 |
| 30-30.9 | 1.05 | 36 and above | 1.35 |

### NORTH LOUISIANA—ARKANSAS FIELDS
***Prices of the Standard Oil Co. of Louisiana**

| | |
|---|---|
| Caddo, below 26 | $1 40 |
| " 26-28.9 | 1.55 |
| " 29-31.9 | 1.70 |
| " 32-34.9 | 2 25 |
| " 35-37.9 | 2.35 |
| " 38 and above | 2.45 |
| Homer, below 31 | 1 85 |
| " 31-32.9 | 2.00 |
| " 33-34.9 | 2.10 |
| " 35 and above | 2 20 |
| Haynesville, below 33 | 2 00 |
| " 33 and above | 2 10 |
| El Dorado, including Lisbon, below 33 | 2 00 |
| " 33-34.9 | 2 10 |
| " 35-36.9 | 2 20 |
| " 37 and above | 2.30 |
| Bull Bayou, 32-34.9 | 1 95 |
| " 35-37.9 | 2.10 |
| " 38 and above | 2 25 |
| Smackover, below 24 | 1.10 |
| " 24-24.9 | 1 35 |
| " 25-25.9 | 1.40 |
| " 26-26.9 | 1 45 |
| " 27 and above | 1.50 |
| De Soto | 2 30 |
| Crichton | 2 10 |
| Bellevue | 1.40 |
| Cotton Valley | 1.20 |
| *Urania La | 1.10 |
| †Calion (East El Dorado) | .95 |

*Gulf, Louisiana Oil Refining and The Texas Co. same prices as Standard.
**Posted by Louisiana Oil Refining Corp.
†Posted by Gulf.

### STEPHENS, ARKANSAS
**Posted by Louisiana Oil Refining Corp., and Atlantic Oil Producing Co.**

| | | | |
|---|---|---|---|
| 26 and above | $1 65 | Below 26 | $1.45 |

### GULF COASTAL FIELDS
**Posted by Humble Oil & Refining Co.**

| | | | |
|---|---|---|---|
| Grades A | $1.40 | 29-29.9 | $1.65 |
| Grades B: | | 30-30.9 | 1 70 |
| Below 25 | 1 40 | 31-31.9 | 1 75 |
| 25-25.9 | 1 45 | 32-32.9 | 1.80 |
| 26-26.9 | 1 50 | 33-33.9 | 1 85 |
| 27-27.9 | 1 55 | 34-34.9 | 1 90 |
| 28-28.9 | 1 60 | 35 and above | 1 95 |

Fields classified as A and B are Goose Creek, Hull, Liberty, West Columbia, Orange, Boling and Pierce Junction. All other fields are Grades A only

## Southern California Market Steadier

LOS ANGELES, Oct. 16.—The market in southern California has settled down this week to an even tenor after a general flurry for several weeks when the gasoline price war was on. The statewide reduction cut in retail price of gasoline naturally affected the wholesale market but the market was rather firm this week.

Export gasoline can be purchased around 9 cents, and it is barely possible this might be shaded a little if an order is large. Tank car lots are around 1 cent more. This price is for 54-58 gravity, while the higher gravities around 58 to 61 sell for about 1 cent more. Those holding large stocks of gasoline are not really begging for a market.

Fuel oil is weak, but that is not late news. Fuel oil can be bought for 85 cents to $1 a barrel. The Standard's posted price of fuel oil is $1 a barrel at Los Angeles, with 4 cents added for north California. But some of the companies are willing to shave this price 10 to 15 cents a barrel. Bunker oils carry the fuel oil prices.

Kerosene can be bought at 5½ to 6 cents tanker cargoes while tank car prices range around 6 to 6½ cents, with few refiners paying much attention to this product. One large refiner said this week he did not care to bid on kerosene.

The demand for gas oil calls for 30-34 gravity rather than the lower grades and prices range around $1.35 to $1.40 a barrel.,

### Crude Price Changes

OIL CITY PA.—On Oct. 16 Joseph Seep Purchasing Agency reduced Keister crude in Butler county, Pa., 25 cents, to $2.05 per barrel at wells.

## Oil Industry Can Best Solve Its Own Problems

By W. M. Peck
Deepwater Oil Refineries
Written for National Petroleum News

Oil being so prominently featured everywhere, it is only natural that attention should be focused on the magnitude of the Oil industry, and arguments for and against the methods used in the conduct of the Oil business are advanced from all sides by people of every kind and class.

Petroleum with its great power to help mankind stands in the front rank of the world's greatest benefactors and as one of the most constructive factors in industrial history, and it seems that its problems can best be solved and the general welfare best served by those within or those who are in some way connected with the Oil industry, and who are conversant with facts rather than by those outside who may be merely guessing.

The legitimate Oil industry is doing its very best to serve the public well at all times and is accomplishing untold good that rarely, if ever, comes to the surface; hence many times fails to receive that recognition which it so justly deserves.

# Purchasers, in All Fields (in Effect, Oct. 18, 1926)

### GULF COASTAL FIELDS
**Prices of The Texas Co.**

| | | | |
|---|---|---|---|
| Grades A | $1 60 | *Grades B | $1.60 |
| ‡Grades B (light crude): | | | |
| 35-35.9 | $2 05 | 38-38.9 | $2.20 |
| 36-36.9 | 2 10 | 39-39.9 | 2 25 |
| 37-37.9 | 2 15 | 40 and above | 2 30 |

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on oil below 35° is same as Humble's postings on Grades B.

### SPINDLETOP
**Humble Oil & Refining Co.**

| | | | |
|---|---|---|---|
| Grade A | $1.25 | 25-25.9 | $1.30 |
| Grades B: | | 26-26.9 | 1.35 |
| Below 25 | $1.25 | 27-27.9 | 1.40 |
| 28-28.9 | $1.45 | 30-30.9 | $1.55 |
| 29-29.9 | 1.50 | 31-31.9 | 1.60 |

### ROCKY MOUNTAIN FIELDS
**Prices of Ohio Oil Co. and Midwest Refining Co.**

| | |
|---|---|
| ‡Salt Creek 29-29.9 | $1.73 |
| " " 30-30.9 | 1.81 |
| " " 31-31.9 | 1.89 |
| " " 32-32.9 | 1.97 |
| " " 33-33.9 | 2.05 |
| " " 34-34.9 | 2.13 |
| " " 35-35.9 | 2.21 |
| " " 36-36.9 | 2.29 |
| " " 37 and above | 2.37 |
| Elk Basin | 2.40 |
| Grass Creek light | 2.40 |
| Big Muddy | 2.25 |
| Lance Creek | 2.40 |
| Rock Creek | 2.25 |
| ‡Osage | 2.40 |
| ‡Cat Creek, Mont. | 2.40 |
| Sunburst, Mont. | 1.35 |
| ‡Hogback, N. Mex. | 2.45 |
| Artesia, N. Mex. | 2.20 |

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light, and Elk Basin.

The Texas Co. buys Salt Creek and Big Muddy crude.

### CALIFORNIA
**Standard Oil Co. of California**

| Gravity | Signal Hill Huntington Beach | Ingle-wood Torrance | Newhall, McKittrick, Whittier La Habra | Olinda-Brea Canon, Kern River | Athens-Rosecrans Richfield | Monte-bello Dominguez | Coyote Hills | Santa Fe Springs | Midway-Sunset Elk Hills | Lost Hills | Coalinga | Wheeler Ridge | Santa Maria | Ventura |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-14.9 | $ .85 | $ .85 | $ .85 | $ .75 | $ .85 | ..... | $ .85 | $ .85 | ..... | $ .75 | $ .75 | $ .75 | $ .75 | $ .85 | $ .85 |
| 15-15.9 | .87 | .87 | .85 | .75 | .87 | ..... | .85 | .85 | ..... | .75 | .75 | .75 | .75 | .85 | .85 |
| 16-16.9 | .90 | .90 | .85 | .75 | .90 | ..... | .85 | .85 | ..... | .75 | .75 | .75 | .75 | .85 | .85 |
| 17-17.9 | .94 | .94 | .85 | .75 | .94 | ..... | .85 | .85 | ..... | .75 | .75 | .75 | .75 | .85 | .85 |
| 18-18.9 | .98 | .98 | .86 | .75 | .98 | ..... | .86 | .86 | ..... | .75 | .75 | .75 | .75 | .85 | .85 |
| 19-19.9 | 1 04 | 1 04 | .87 | .75 | 1 04 | ..... | .87 | .87 | ..... | .75 | .75 | .75 | .75 | .85 | .85 |
| 20-20.9 | 1 10 | 1 10 | .89 | ..... | 1 10 | ..... | .89 | .90 | ..... | .82 | .82 | .79 | .78 | .90 | .90 |
| 21-21.9 | 1 16 | 1 16 | .91 | ..... | 1 16 | ..... | .91 | .98 | ..... | .90 | .90 | .86 | .81 | .97 | .97 |
| 22-22.9 | 1 22 | 1 22 | .94 | ..... | 1 22 | ..... | .94 | 1 06 | ..... | 1.00 | 1 00 | .93 | .85 | 1.04 | 1.04 |
| 23-23.9 | 1 28 | 1 28 | ..... | ..... | 1 28 | ..... | .97 | 1 14 | ..... | 1 11 | 1 11 | 1 00 | .89 | 1.11 | 1.11 |
| 24-24.9 | 1 34 | 1 34 | ..... | ..... | 1 34 | $1.34 | 1 01 | 1.22 | $1.02 | 1 22 | 1.22 | 1 07 | .93 | 1.18 | 1.18 |
| 25-25.9 | 1 40 | 1 40 | ..... | ..... | 1 40 | 1 40 | 1.05 | 1.30 | 1.08 | 1 33 | 1 33 | 1 14 | .97 | 1.25 | 1.25 |
| 26-26.9 | 1 46 | 1 46 | ..... | ..... | 1 46 | 1 46 | 1 09 | 1.38 | 1 16 | 1 44 | 1 44 | 1 21 | 1.01 | 1 32 | 1 32 |
| 27-27.9 | 1 52 | 1 52 | ..... | ..... | 1 52 | 1 52 | 1 13 | 1 46 | 1 24 | 1 55 | 1 55 | 1 28 | 1.05 | 1 39 | 1 39 |
| 28-28.9 | 1 58 | 1.58 | ..... | ..... | 1 58 | 1 58 | 1 17 | 1 54 | 1 32 | 1 66 | 1 66 | 1.35 | ..... | 1.46 | 1.46 |
| 29-29.9 | 1 64 | ..... | ..... | ..... | 1 64 | 1 64 | 1.21 | 1.62 | 1 40 | 1 77 | 1.77 | 1 42 | ..... | 1.53 | 1 53 |
| 30-30.9 | 1 70 | ..... | ..... | ..... | 1.70 | 1 70 | 1.25 | 1.70 | 1 48 | 1 88 | 1.88 | 1.49 | ..... | 1.60 | 1 60 |
| 31-31.9 | 1 76 | ..... | ..... | ..... | ..... | 1 76 | ..... | ..... | 1 60 | 1 99 | 1 99 | 1.56 | ..... | ..... | 1.67 |
| 32-32.9 | 1.84 | ..... | ..... | ..... | ..... | 1 84 | ..... | ..... | 1 72 | 2 10 | 2 10 | 1.63 | ..... | ..... | 1 75 |
| 33-33.9 | ..... | ..... | ..... | ..... | ..... | 1 92 | ..... | ..... | 1 84 | 2.21 | 2 21 | 1 70 | ..... | ..... | 1 79 |
| 34-34.9 | ..... | ..... | ..... | ..... | ..... | 2 00 | ..... | ..... | 1 96 | ..... | 2.32 | 1 77 | ..... | ..... | 1 85 |
| 35-35.9 | ..... | ..... | ..... | ..... | ..... | 2 08 | ..... | ..... | 2 08 | ..... | ..... | 1.84 | ..... | ..... | 1.92 |
| 36-36.9 | ..... | ..... | ..... | ..... | ..... | 2 16 | ..... | ..... | 2 16 | ..... | ..... | ..... | ..... | ..... | ..... |
| 37-37.9 | ..... | ..... | ..... | ..... | ..... | 2 24 | ..... | ..... | 2 24 | ..... | ..... | ..... | ..... | ..... | ..... |
| 38-38.9 | ..... | ..... | ..... | ..... | ..... | 2 34 | ..... | ..... | 2 34 | ..... | ..... | ..... | ..... | ..... | ..... |
| 39-39.9 | ..... | ..... | ..... | ..... | ..... | 2 44 | ..... | ..... | 2.44 | ..... | ..... | ..... | ..... | ..... | ..... |
| 40-40.9 | ..... | ..... | ..... | ..... | ..... | 2 54 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 41-41.9 | ..... | ..... | ..... | ..... | ..... | 2 64 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 42-42.9 | ..... | ..... | ..... | ..... | ..... | 2 74 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

**Santa Maria and Ventura Posted by *Union Oil Co.**

*Union Oil Co. also purchases Long Beach crude and is maintaining the same gravity and price schedule in that field as the Standard maintains in Signal Hill and Huntington Beach fields. The Union also buys and pays the same prices as the Standard in the Rosecrans-Dominguez fields, on gravities ranging from 14 degrees to and including 24.9 degrees, and in Santa Fe Springs, on gravities ranging from 20 to and including 28.9 degrees.

# REFINERS' and COMPOUNDERS' SUPPLIES

Following are the average market prices for the week on materials used by refiners and compounders f. o. b. shipping point as effective this date.

### Refiners' Supplies

| | Oct. 18 | Oct. 11 |
|---|---|---|
| Soda Ash light 58% bags.cwt. | $1.38 | $1 38 |
| Silicate of Soda 60 deg. drums .....cwt. | $1 65 | $1 65 |
| Sal Soda wks ..... | .90- 1 10 | .90- 1 10 |
| Caustic Soda 70% solid. cwt. | - 3.10 | - 3.10 |
| Chloride of Lime .....cwt. works ..... | - 2.00 | - 2.00 |
| Sulphuric Acid 60 deg. tank cars f. o. b shipping point .... per ton | 10.50-11.00 | 10.50-11.00 |
| Liquid Chlorine tank cars works.....lb. | - .04 | - .04 |

### Compounders' Supplies (Open Market)

| | | |
|---|---|---|
| **Vegetable Oils—** | | |
| Linseed carloads spot.....lb. | 10 9 | 11 |
| Oct.-Dec. ..... | 10.9 | 11 |
| Tanks, spot ..... | 11 1 | 11 2 |
| Boiled carloads spot .....lb. | 10 5 | 10 6 |
| *Soya Bean spot, Bbls....lb. | 14¾ | 14¾ |
| **Castor Oil—** | | |
| No 1 Carlots, Bbls..... | -.12¾ | -.12¾ |
| No. 3 Carlots, Bbls..... | -.11¾ | -.11¾ |
| **Animal Oils—** | | |
| English Degras.....lb. | .05½ | -.05½ |
| Domestic Degras, bbls., carloads.....lb. | -.04¾ | -.04¾ |
| *Horse .....lb. | -.08¼ | -.08½ |
| **Oleic Acid—** | | |
| Dist. Bbls .....lb. | .09¾-.10¼ | .09¾-.10¼ |
| Saponified Bbls.....lb. | .10 -.10½ | .10 -.10½ |
| **Lard Oils—** | | |
| Prime Winter Strained. to 1½ffa.40/45c.t lb. | .16⅞ | .16⅞ |
| Extra Winter Strained. 2 to 4½ffa.40/45c.t.lb. | .13¼ | .13¼ |
| Extra . 4 to 5 ffa.40/45c.t lb. | .12¾ | .12¾ |
| Extra No.1 7 to 10 ffa.40/50c t lb. | .11¾ | 11¾ |
| No 1 ... 15 to 18 ffa.40/45c.t lb. | .11½ | .11½ |
| No 2 ...22 to 23 ffa.40/45c.t lb. | .11¼ | .11¼ |
| Prime Edible Tallow under 1⅞ffa 40/45c t.N.Y ..... lb. | - .09½ | -.09½ |
| Tallow acidless..... lb. | - 11¾ | -.11½ |
| Lard Stearine ..... lb. | -.17 | -.17¼ |
| Oleo Stearine .....lb. | -.12½ | -.12½ |
| **Neatsfoot Oil—** | | |
| Pure .....bbls.-lb. | .15¾ | .15¾ |
| Extra.....do...lb. | .11¾ | .11¾ |
| No. 1.....bbls.-lb. | .11½ | .11½ |
| Cold pressed.....lb. | .18¾ | .18¾ |
| **Fish Oils—** | | |
| Menhaden Oil Light pressed.....gal. | -.65 | -.65 |
| White .....gal. | - 70 | - 70 |
| Yellow bleached .....gal. | -.68 | -.68 |
| *Herring tank cars coast .....gal. | -.47 | -.47 |
| Whale, extra winter bleached.....gal. | .82 | -.82 |
| Seal .....gal. | | nominal |
| **Naval Stores—** | | |
| Turpentine, N. Y.....gal. | .91 | .91½ |
| Turpentine† .....gal. | 84½ | .85½ |
| Rosin, B. N. Y.....bbl. | 13 75 | 14 00 |
| Rosin, F. N. Y.....bbl. | 14 30 | 14.25 |
| Rosin, B† .....bbl. | 12 25 | 12.25 |
| Rosin, F† .....bbl. | 12.75 | 12.25 |
| Rosin Oil 1st run.....gal. | .85 | .85 |
| Rosin Oil 2nd run.....gal. | .90 | .90 |
| **Pine Tar—** | | |
| Kiln Burnt.....bbl. | 15.00 | 14.50 |
| Retort.....bbl. | 18.50 | 18.50 |

†Savannah, Ga. market.
*Nominal

| | | |
|---|---|---|
| **Alcohol—Denatured** Formula 5 | | |
| Bbls .....gal. | -40 | -40 |
| Drums.....gal. | -38 | -38 |

Market Section

# Hearing Ordered for Oct. 27 On Revisions of Tank Car Rules

By Special Correspondent.

WASHINGTON, Oct. 16.

ANNOUNCEMENT was made recently tha. W. P. Bartel, chief of the Interstate Commerce Commission's Bureau of service, the organization that manages the operation of the physical properties of the railroads in so far as the government undertakes such management, will hold a hearing on Oct. 27 for the consideration of suggestions the owners of tank cars may have to proposed ammendments to tank car specifications. The day before that Col. Beverly W. Dunn, chief of the American Railway Association's bureau of explosives will hold a conference with a view to reducing to a minimum the issues to be presented to the regulating body by getting agreements, where possible, between the railroads and the owners of tank cars and the users of containers for dangerous and inflammable commodities offered for transportation by freight or express.

The tank car committee of the American Petroleum Institute, because it has been handling the subject for three or four years, will have charge of the hearing for the oil industry. Inasmuch as the great bulk of the 150,000 or 160,000 tank cars are used in transporting petroleum and its products, much of the time of the hearing will be devoted to the oil tank car.

However, the subject has been under such long and practically continuous discussion by the members of the tank car committee of the institute, the Dunn organization and the representatives of the regulating body that the hearing may not be as sharp a thing as might be expected.

The chief proposal, made by the commission is that it take over the tank car regulations from the American Railway Association, amend them and make them its own. Inasmuch as the law directs the commission to make regulations for safety the mere fact that the commission has made the proposal may be taken as indicating that the taking over will be done.

As part of the taking over program, the regulating body proposes to change the numbers of the sepecifications for tank cars by adding 100 to each of the A.R.A. numbers, so that Nos. 3, 4 and 4a, the types of tank cars used by the oil industry will become Nos. 103, 104 and 104a. Nos. 3 and 4 are the types generally used for inflammable liquids while No. 4a is the insulated tank car used for the same service.

Whatever contention there will be between the American Petroleum Institute and the commission proposals will center around the dome and the cover for the dome manhole. There may also be a fight on the proposal of the commission over this provision proposed to be added to paragraph 400 and to be known as (9-a), as follows:

"Tanks mounted on or forming part of a car prior to (date to be agreed upon, if possible but in any event to be fixed by the commission) and built in compliance with the requirement in effect at the time the tank was built, may be kept in service until the further order of the commission. For these tanks the manhole cover of the expansion dome, when renewed, must comply with the requirements of Par. 10 of Specification No. 103." That means that when it is necessary to replace the dome cover the renewed part must comply with the latest specification in respect of tank cars of type No. 103 and not comply with the specification in effect at the time the car was built.

The institute objects to setting a date limit and suggests a wording contained in the specification as drawn by the American Railway Association for that type of tank. The date contained in the commission proposal is next July.

Another proposal, made by the commission, which may cause considerable discussion, if not opposition is as follows:

"433. For tanks used for the transportation of inflammable liquids with flash point below 20 degrees F., when the construction of the tank is such as to require the removal of the manhole cover in order to unload the contents, the mechanical arrangement for closing the expansion dome manhole must be such as to make it impossible to remove the manhole cover while the interior of the tank is subjected to pressure sufficient to cause an objection of any liquid authorized for transportation in the tank: Provided, That any manhole cover that does not have to be removed in order to load or unload the tank may be constructed and fastened in position by any method that includes a locking device that must be destroyed in order to remove the cover: Provided further, that for tanks constructed prior to July 1, 1927, any manhole cover may be constructed in any manner such that suitable vents will be opened automatically before the cover is entirely removed."

Dozens of other changes are also proposed. Generally, however, they are revisions of language rather than of substance, or at least they are so characterized by the men of the commission who have been devising them and now present them as targets at which the industry may take shots at the hearing on Oct. 27.

## 2000-Foot Test Started In Tennessee

MURFREESBORO, TENN., Oct. 16.—A great deal of interest is developing locally in a test well being drilled just north of Murfreesboro, near the city limits, on the farm of G. H. Alsup. The hole is down 250 feet and difficulty has been encountered in casing off fresh water. The plan is to drill 2000 feet.

The wildcat test was financed by a mutual arrangement between a local company and the North American Development Co. of Washington, D. C. The local company is called the Rutherford County Oil & Gas Co., capitalized at $25,000 with $15,000 paid in. The $15,000 was raised by popular subscription and all of it was invested in stock in the North American Development Co., with the understanding that it would all be spent on the local test.

Several shallow tests have been drilled in Rutherford county. The last one was on Mr. Randolph's land and was dry. None of them has been deeper than 1600 feet. The test on the Alsup farm is being drilled with a standard cable rig and designed to test the territory thoroughly.

### Benzol Demand Increases

NEW YORK, Oct. 18.—Demand for motor benzol has improved in the last few days but stocks are large and the market tendency is still easy. Leading marketers are quoting 24 cents a gallon in tank cars at the ovens. Jobbing demand is fairly active although chiefly for prompt deliveries.

Production is heavy, reflecting the large coke output. Export demand is more spirited. No price changes are expected during the immediate future. Pure and 90 per cent benzol are quoted at 24 cents a gallon.

## South Dakota Independents Cut Gasoline 1 Cent

CHICAGO, Oct. 15.—Independent oil jobbers of South Dakota reduced their gasoline prices both tank wagon and service station 1 cent throughout the state Oct. 16. The news reached Chicago by wire late Friday afternoon from Fred H. Buehler, secretary of the South Dakota Independent Oil Jobbers' Association.

The unusual action of Independents leading in a tank wagon price reduction is due to political conditions. For four years South Dakota, as a government, has owned seven or eight filling stations with bulk storage, well distributed over the state. For a time the state ran the stations selling gasoline at cut prices.

While W. H. McMaster, then governor, was garnering the votes that elected him to the Senate, the motorists of South Dakota were supplied gasoline at the delivered cost plus a nominal overhead at state stations manned by highway department employes. Even yet the administration watches gasoline prices and menaces the local jobbers with devastating competition whenever margins are fairly wide.

# Transactions In Oil Shares on New York Stock Exchange

| 1925 High | 1925 Low | 1926 High | 1926 Low | | Listed Capital | Par Value | Stocks | Div. Rate | Last Paid | Transactions week ended Oct. 16 Sales | First | High | Low | Last | Ch'ge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 3/8 | 2 1/4 | (sh) | 718 000 | N.P. | Amerada Corp. | 40cQ | July 30 26 | 7,300 | 29 | 29 3/4 | 27 3/8 | 28 3/4 | — 3/8 |
| 79 1/4 | 48 | 71 | 47 | (sh) | 200 000 | N P | American Republics | | | | | | | | |
| 47 1/4 | 32 | 39 1/2 | 44 3/4 | $ | 56 000 000 | $25 | Associated Oil | 50cQ | Sept. 25, 26 | 900 | 50 | 50 | 50 | 50 | — 1/2 |
| 117 1/2 | 95 1/2 | 128 3/4 | 97 | | 50 000 000 | 100 | Atlantic Refining | | June 16, 24 | 20,500 | 101 | 103 3/8 | 98 1/4 | 99 3/4 | —3 3/8 |
| 117 3/4 | 113 1/2 | 120 | 115 3/4 | | 20 000 000 | 100 | do pfd | $1 3/4Q | Aug. 2, 26 | | | | | | |
| 33 1/2 | 18 3/4 | 33 1/2 | 23 3/4 | | 25 000 000 | 25 | Barnsdall Corp. A | 50cQ | Oct. 1, 26 | 7,700 | 25 3/4 | 26 1/2 | 25 3/8 | 25 3/8 | — 3/8 |
| 30 | 16 | 29 1/2 | 23 | | 3 713 275 | 25 | do B | 50cQ | Oct. 1, 26 | 1,200 | 24 7/8 | 24 7/8 | 24 | 24 | 0 |
| 84 3/8 | 37 3/8 | 38 1/8 | 29 3/4 | $ | 45 040 125 | $25 | California Petroleum | 50cQ | Sept. 1, 26 | 25,200 | 30 1/4 | 30 3/4 | †29 3/4 | 30 3/8 | 0 |
| 70 | 42 1/2 | 94 1/2 | 50 | | 23 542 500 | 100 | General Asphalt | | | 52,900 | 77 | 79 3/8 | 72 3/8 | 72 3/8 | —1 3/8 |
| 109 | 86 1/2 | 140 1/8 | 94 3/8 | | 7 416 000 | 100 | do pfd | $1 1/4Q | Sept. 1, 26 | 1,000 | 117 | 117 | 112 | 112 | —8 |
| 85 | 59 | 72 | 50 1/4 | | 25 000 000 | 100 | Houston Oil | | | 2,600 | 54 | 54 | 52 | 52 1/2 | —1 1/2 |
| 41 3/4 | 13 1/2 | 84 | 19 5/8 | (sh) | 500 000 | N.P. | Independent Oil & Gas | 25cQ | Oct. 18 26 | 27,800 | 24 1/2 | 27 | 23 7/8 | 25 3/4 | +1 1/4 |
| 14 1/2 | 5 1/2 | 13 3/4 | 8 | $ | 3,204,590 | $10 | Indian Refining | | Dec. 15 20 | 2,500 | 8 | 9 | 8 | 8 3/4 | + 3/4 |
| 12 5/8 | 6 | 12 1/2 | 7 3/8 | | 4 545 860 | 10 | do ctfs | | | 4,400 | 8 3/4 | 8 3/4 | † 7 3/8 | 7 3/4 | — 1/4 |
| 110 | 77 | 104 | 90 | | 2,296,400 | 100 | do pfd | | Dec. 15, 21 | | | | | | |
| 1 1/2 | 1/4 | 3/4 | 1/4 | | 1,678,760 | 10 | Kansas & Gulf | | | 500 | 1/4 | 1/4 | 1/4 | 1/4 | 0 |
| | | 24 1/2 | 19 3/8 | (sh) | 4,000,000 | N.P. | Lago Oil & Transport | | | 27,600 | 19 7/8 | 20 1/4 | 19 1/2 | 19 3/8 | — 3/8 |
| 23 3/4 | 13 3/4 | 19 7/8 | 12 | (sh) | 1,131,216 | N P | Louisiana Oil Refining | | | 7,200 | 15 | 15 | 14 1/2 | 14 1/2 | — 3/8 |
| | | 97 | 93 1/2 | $ | 4,000,000 | $100 | do pfd | $1 3/8Q | Aug. 16 26 | 600 | 95 1/2 | 95 1/2 | 95 1/2 | 95 1/2 | 0 |
| 35 1/2 | 20 1/4 | 28 7/8 | 16 1/2 | (sh) | 330,000 | N P. | Maracaibo Oil | | | 1,700 | 17 1/2 | 18 | 17 | 17 | —1 |
| 60 1/2 | 32 5/8 | 63 3/8 | 49 1/4 | (sh) | 1,895 823 | N P | Marland Oil Co | $1Q | Sept. 30, 26 | 41,900 | 53 | 54 1/8 | 52 | 52 1/8 | —1 3/8 |
| £50 | £25 | | | $ | 45,942,800 | $100 | Mexican Petroleum | $3Q | Oct. 20 26 | | | | | | |
| | | | | | 12,000,000 | 100 | do pfd | $2Q | Oct. 20 26 | | | | | | |
| 22 1/2 | 20 | 13 3/4 | 6 | (sh) | 945,939 | N.P. | Mexican Seaboard | | Nov 15 24 | 2,100 | 8 1/8 | 10 | 8 1/8 | 8 3/4 | + 5/8 |
| 38 | 25 3/4 | 37 | 27 1/2 | (sh) | 1 357 800 | N P. | Mid-Continent Petroleum | | Aug 1, 23 | 18,100 | 30 1/8 | 30 5/8 | 29 3/4 | 29 1/2 | — 3/4 |
| 94 1/4 | 88 | 100 1/8 | 90 | $ | 6 718 000 | $100 | do pfd | $1 3/4Q | Sept. 1, 26 | 200 | 97 1/2 | 97 1/2 | 97 | 97 | — 3/8 |
| 3 1/4 | 5/8 | 2 1/2 | 1 | | 25,315,540 | 10 | Middle States | | July 1, 25 | 3,700 | 1 | 1 1/8 | 1 | 1 | 0 |
| 1 1/2 | 1 1/2 | 1 1/8 | 1/2 | | 4,384,680 | | do ctfs | | | 900 | 1/2 | 3/4 | 1/2 | 3/8 | + 1/8 |
| 78 1/2 | 51 3/8 | 83 1/4 | 1 | (sh) | 3,500,000 | N P | Pacific Oil | | Jan 20 26 | 10,000 | 1 3/8 | 1 1/2 | 1 3/8 | 1 3/8 | 0 |
| 83 7/8 | 59 1/2 | 78 1/2 | 56 1/8 | $ | 48,307,400 | $50 | Pan American P & T | $1.50Q | Oct. 20 25 | 1,300 | 62 1/2 | 63 | 61 1/2 | 61 1/2 | —1 1/2 |
| 84 1/2 | 60 1/4 | 78 3/4 | 58 7/8 | | 91,025,100 | 50 | do B | $1.50Q | Oct. 20, 26 | 39,000 | 62 7/8 | 63 1/4 | 61 3/4 | 61 3/4 | —1 3/4 |
| 49 3/4 | 37 1/4 | 46 | 30 | (sh) | 400,000 | N P | Pan American Western B | 50cQ | July 30, 26 | 5,800 | 31 | 31 1/2 | †30 | 30 7/8 | — 1/8 |
| 6 1/4 | 2 1/4 | 8 2 | 4 1/2 | (sh) | 198,770 | N P. | Panhandle P. & R | | | 4,700 | 14 1/2 | 15 1/2 | 13 | 13 | —2 1/2 |
| 60 1/2 | 37 | 99 3/4 | 51 | $ | 2,935,200 | $100 | do pfd | | July 2 23 | | | | | | |
| 47 1/8 | 36 1/4 | 52 3/4 | 40 | (sh) | 2,406,692 | N P | Phillips Petroleum | 75cQ | Oct. 1, 26 | 52,300 | 47 3/4 | 48 3/4 | 46 1/2 | 46 3/4 | —1 1/8 |
| 3 1/2 | 1 1/4 | 1 7/8 | 1/2 | $ | 29,622 925 | $25 | Pierce Oil Corp | | | 4,900 | 1/2 | 5/8 | 1/2 | 1/2 | 0 |
| 40 | 20 1/4 | 27 1/4 | 12 1/2 | | 15,000,000 | 100 | do pfd | | Feb. 1, 22 | | | | | | |
| 8 1/4 | 4 1/2 | 7 | 2 1/4 | (sh) | 2 500,000 | N.P. | Pierce Petroleum | | | 4,800 | 2 1/2 | 2 1/2 | 2 1/2 | 2 1/2 | 0 |
| 32 5/8 | 12 1/2 | 18 1/2 | 11 | $ | 11,467,850 | $50 | Producers & Refiners | | Sept. 15 23 | 19,500 | 15 1/2 | *18 1/2 | 15 3/4 | 16 5/8 | +1 1/8 |
| 47 3/8 | 27 | 39 | 30 3/4 | | 2,845,350 | 50 | do pfd | | May 1 25 | 1,700 | 37 | *39 | 36 1/2 | 36 1/2 | +2 3/8 |
| 33 3/4 | 25 1/8 | 31 | 25 3/8 | | 75,959,250 | 25 | Pure Oil Co | 37 1/2cQ | Sept. 1, 26 | 8,800 | 26 | 26 3/4 | 25 3/4 | 25 3/4 | — 3/8 |
| 108 1/2 | 103 | 112 3/4 | 106 | | 13,000,000 | 100 | do 8% pfd | $2Q | Oct. 1, 26 | 100 | 109 3/4 | 109 3/4 | 109 3/4 | 109 3/4 | — 3/4 |
| 57 3/8 | 48 1/4 | 57 3/8 | 47 5/8 | (sh) | 691,922 | 13 40 | Royal Dutch, N Y shares | $1.739 | Aug. 2, 26 | 6,000 | 48 3/8 | 49 1/8 | †47 3/8 | 48 3/8 | — 1/8 |
| 49 | 39 1/2 | 48 5/8 | 41 | (sh) | 93,345 | £2 | Shell Transport & T | $1 21 | July 24 26 | 400 | 42 | 42 1/2 | 42 | 42 1/2 | — 1/2 |
| 28 3/4 | 21 3/8 | 30 1/4 | 24 | (sh) | 10,000,000 | N P | Shell Union Oil | 35cQ | Sept. 30, 26 | 16,600 | 27 3/4 | 28 1/8 | 27 1/2 | 28 | + 3/4 |
| 106 1/2 | 99 1/2 | 114 | 103 | $ | 20,000,000 | $100 | do pfd | $1 1/2Q | Aug. 15, 26 | 200 | 108 | 108 | 108 | 108 | + 1/2 |
| 28 1/2 | 17 1/4 | 28 5/8 | 15 1/8 | | 7,207 620 | 10 | Simms Petroleum | 50cS.A. | July 1 26 | 14,500 | 18 | 18 1/2 | 17 3/8 | 17 3/8 | — 3/8 |
| 24 7/8 | 17 | 24 1/8 | 18 | (sh) | 4,489,887 | N P | Sinclair Consolidated | | May 31, 24 | 19,700 | 18 3/8 | 18 1/2 | 18 | 18 | — 1/2 |
| 94 1/8 | 78 1/4 | 99 1/2 | 90 | $ | 17 852,200 | $100 | do pfd | $2Q | Aug. 15, 26 | 300 | 96 1/8 | 96 3/8 | 95 1/2 | 95 1/2 | — 1/2 |
| 32 1/2 | 21 1/4 | 36 7/8 | 26 3/4 | | 23,988 590 | 25 | Skelly Oil Co | 50cQ | Sept 15 26 | 17,700 | 32 1/2 | 32 3/4 | 30 1/8 | 30 1/2 | —2 3/8 |
| | | 63 3/4 | 52 3/8 | (sh) | 13,016,434 | N.P. | S O California | 50cQ | Sept 15 26 | 27,400 | 61 1/8 | 61 3/8 | 60 1/4 | 60 1/2 | — 1/2 |
| 47 1/2 | 38 3/8 | 46 3/8 | 40 1/4 | | 513,109 675 | 25 | S O New Jersey | 25cQ | Sept. 15, 26 | 27,400 | 42 | 42 3/8 | 41 3/4 | 41 3/4 | — 3/4 |
| 119 | 116 1/4 | 119 1/8 | 115 1/4 | | 199,972,900 | 100 | do pfd | $1 3/4Q | Sept 15, 26 | 2,100 | 116 | 116 1/4 | 116 | 116 1/4 | + 1/4 |
| 43 7/8 | 38 1/4 | 41 3/8 | 30 1/8 | (sh) | 1,103,931 | N P. | Sun Oil | 25cQ | Sept. 15 26 | 600 | 32 1/2 | 32 3/4 | 32 1/2 | 32 3/4 | — 3/8 |
| 6 1/8 | 2 | 4 1/4 | 1 | (sh) | 1,121,368 | N.P. | Superior Oil Corp | | Dec. 20, 20 | 8,500 | 2 3/4 | 2 3/4 | 2 3/8 | 2 1/2 | — 3/8 |
| 55 | 4 3/4 | 57 1/4 | 48 | $ | 164,450 000 | $25 | The Texas Co | 75cQ | Sept 30, 26 | 22,100 | 52 1/4 | 53 5/8 | 51 3/8 | 52 | — 3/4 |
| 23 3/4 | 10 7/8 | 19 5/8 | 12 1/8 | | 8,380,340 | 10 | Texas Pacific Coal & Oil | | June 30, 23 | 10,000 | 13 3/4 | 14 | 13 | 13 1/8 | — 3/8 |
| 38 7/8 | 30 1/4 | 39 1/4 | 28 | (sh) | 2,137,570 | N P. | Tide Water Oil Co | 37 1/2c | Sept. 30, 26 | 100 | 28 | 28 | 28 | 28 | 0 |
| 101 | 99 | 103 | 89 3/4 | $ | 20,672,900 | $100 | do 5% pfd | $1.25Q | Aug. 15, 26 | 200 | 90 | 90 | 89 1/4 | 89 1/4 | 0 |
| 5 1/4 | 3 1/2 | 5 1/2 | 3 | (sh) | 3,742,029 | N.P. | Transcontinental Oil | | | 9,900 | 3 3/4 | 4 | 3 3/4 | 3 3/4 | — 1/8 |
| 43 3/8 | 33 | 58 3/4 | 37 1/4 | $ | 40 480,800 | $25 | Union Oil of California | 50cQ | Aug. 10, 26 | 39,300 | 52 1/4 | 53 3/4 | 51 1/2 | 54 1/4 | +3 |
| 134 | 96 1/4 | 120 | 80 | | 24,423,300 | 100 | Union Tank Car Co | $1 1/2Q | Sept. 1, 26 | 1,900 | 116 | 116 1/2 | 114 3/4 | 115 | —3 |
| 117 1/8 | 113 1/4 | 118 | 113 1/4 | | 12,000,000 | 100 | do pfd | $1 3/4Q | Sept 1, 26 | 600 | 115 1/4 | 115 1/2 | 115 1/8 | 115 1/2 | + 3/8 |
| 31 3/4 | 25 1/2 | 29 1/4 | 25 1/8 | (sh) | 490,000 | N P | White Eagle Oil & Refining | 50 Q | Oct 20 26 | 1,000 | 26 1/8 | 26 3/8 | 25 1/2 | 25 1/2 | —1 3/8 |

*New High †New Low x Ex-dividend Total Sales 637,900

# Pittsburgh Stock Exchange

| 1925 High | 1925 Low | 1926 High | 1926 Low | Par Value | Stocks | Transactions Week Ended Oct. 15 Sales | First | High | Low | Last | Ch'ge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 5/8 | 6 5/8 | N.P. | Andes Petroleum | | | | | | |
| 8 3/4 | 5 1/4 | 8 1/2 | 5 3/4 | $10 | Arkansas Nat. Gas | 5,250 | 7 3/8 | 7 3/4 | 7 3/8 | 7 3/4 | + 3/8 |
| | | 97 1/2 | 79 3/4 | 100 | Columbia Gas (w.i.) | | | | | | |
| | | 97 1/2 | 93 | 8100 | Col. Gas & El.pfd.w.i. | 201 | 97 | 97 1/2 | 97 | 97 1/2 | —1 |
| 18 | 14 1/2 | 17 | 12 1/2 | $10 | Devonian Oil | 165 | 16 | 16 | 15 | 15 | —1 1/4 |
| 112 5/8 | 105 3/8 | 115 1/2 | 112 | 8100 | Duquesne Lt. 7s pfd. | | | | | | |
| | | 10 | 5 1/2 | N.P. | Houston Gulf Gas | 200 | 6 | 6 | 6 | 6 | 0 |
| | | 46 | 39 | 25 | Lone Star Gas Corp. | 16,863 | 44 1/4 | *46 | 44 | 45 3/4 | + 1/2 |
| 37 1/4 | 31 | 44 | 33 3/8 | 25 | Ohio Fuel Corp | 1,237 | 43 | 43 1/2 | 4 3/4 | 43 1/2 | + 1/2 |
| | | 44 | 4 | | do ctfs. of deposit | 3,821 | 43 | 43 3/4 | 4 1/2 | 43 1/4 | + 1/4 |
| | | 5 1/2 | 5 | | Ohio Oil & Gas | | | | | | |
| 34 | 26 | 34 | 28 | 25 | Oklahoma Nat. Gas | | | | | | |
| | | 20 1/4 | 19 1/4 | | do ctfs. of deposit | 4,790 | 20 | 20 | 19 1/2 | 19 1/2 | — 1/4 |
| 8 3/4 | 5 | 5 5/8 | 3 3/8 | 5 | Pittsburgh O. & G | | | | | | |
| 9 5/8 | 6 | 10 | 8 | 10 | Salt Creek Cons | | | | | | |
| 13 3/4 | 8 1/2 | 9 4 | 8 | 10 | Tidal Osage | 13,130 | 24 | *24 | 21 | 23 7/8 | + 7/8 |
| | | 42 1/2 | 40 3/4 | N.P. | Waverly Oil Wks. "A" | 100 | 41 | 41 | 41 | 41 | — 1/4 |

# Pittsburgh Curb Market

| 1925 High | 1925 Low | 1926 High | 1926 Low | Par Value | Stocks | Transactions Week Ended Oct. 15 Sales | First | High | Low | Last | Ch'ge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 1/2 | .60 | 3 3/8 | 2 1/2 | $ 5 | Columbia Synd | | | | | | |
| .60 | .15 | .15 | .15 | 5 | Duquesne Oil | | | | | | |
| 9 | 5 1/2 | 22 | 22 | 10 | Forest Oil | | | | | | |
| | | | | | Cutler-Hammer Oil | 60 | 22 | 22 | 22 | 22 | |
| 92 3/8 | 64 | 91 1/2 | 85 | 25 | Gulf Oil Corp | | | | | | |
| | | 79 | 79 | 100 | Houston Gulf pfd | | | | | | |
| 12 1/2 | 3 3/4 | 12 | 7 1/2 | N.P. | Leonard Oil & Dvlp | | | | | | |
| | | 1 3/8 | 1 3/8 | N.P. | Mountain & Gulf | | | | | | |
| | | 30 3/4 | 29 | | Oklahoma Gas | | | | | | |
| .47 | .20 | .42 | .15 | 10 | Omar O. & G | | | | | | |
| | | 2 | 1 3/4 | 5 | Pittsburgh Oil Dev | | | | | | |
| 27 1/2 | 25 | 33 1/2 | 26 | 10 | Plymouth Oil | | | | | | |
| 7 | 3 | 5 1/2 | 3 | 5 | States Oil | 100 | 4 1/2 | 4 1/2 | 4 1/2 | 4 1/2 | + 1/4 |
| 4 | 1 3/8 | 3 1/2 | 2 | $ 1 | Texon Oil & Land | 450 | 2 1/8 | 2 1/8 | 2 1/8 | 2 1/8 | 0 |
| 11 | 9 | 20 | 8 | 10 | Tidal Osage (non-voting | 100 | 20 | 20 | 20 | 20 | +1 |

*New High †New Low xEx Dividend ‡Ex-Rights

## NEW YORK CURB BONDS

**Week Ending Oct. 15**

| | High | Low | Last | Ch'ge |
|---|---|---|---|---|
| Cities Serv. 6s '66 | 95 | 94 1/2 | 94 7/8 | + 1/4 |
| Cities Serv. 7s "D" '66 | 113 3/4 | 113 3/8 | 113 3/8 | + 1/4 |
| Galena S. O. 7s '30 | 92 | 89 | 89 | —3 |
| General Pet. 6s '28 | 101 1/2 | 101 1/8 | 101 1/2 | + 1/8 |
| Gulf Oil 5s '37 | 100 1/8 | 100 1/8 | 100 1/8 | 0 |
| Gulf Oil 5 1/2s '26 | 100 3/4 | 100 3/4 | 100 3/4 | — 1/4 |
| Indepen. Oil 6 1/2s '31 | 97 | 96 1/2 | 97 | 0 |
| Pan Amer. Pet. 6s '40 | 99 3/8 | 99 1/4 | 99 3/8 | — 1/4 |
| Pennok Oil 6s '27 | 100 | 100 | 100 | 0 |
| Pure Oil 6 1/2s '33 | 103 1/4 | 103 1/8 | 103 1/8 | — 1/8 |
| Richfield Oil 6s w.i. | 99 | 99 | 99 | 0 |
| S O N Y 6 1/2s '33 | 105 1/4 | 104 3/4 | 105 | 0 |
| Sun Oil 5 1/2s '39 | 99 3/4 | 99 1/4 | 99 3/4 | + 1/4 |
| Tidal Osage 7s '31 | 103 1/4 | 103 1/4 | 103 1/4 | — 1/4 |
| Trans. Cont. Oil 7s '30 | 97 3/4 | 97 3/4 | 97 1/2 | 0 |
| United Oil Prod. 8s '31 | 35 | 35 | 35 | 0 |

## NEW YORK BONDS

**Week Ending Oct. 15**

| | High | Low | Last | Ch'ge |
|---|---|---|---|---|
| Associated Oil gold 6s | 103 3/4 | 103 1/2 | 103 3/4 | + 1/4 |
| Atl. Gulf & W.I. ss 5s | 68 | 68 | 68 | +1 |
| Atlantic Refg. deb 5s | 100 3/8 | 100 1/8 | 100 3/8 | + 1/8 |
| Barnsdall Corp. 6s | 97 | 96 3/4 | 96 3/4 | + 1/4 |
| Cal Petrol. sf 6 1/2s | 104 | 103 1/2 | 103 1/2 | + 1/2 |
| Empire Gas & Fuel 7 1/2s | 103 7/8 | 103 1/4 | 103 1/2 | + 1/8 |
| Empire Gas & Fuel 6 1/2s | 96 3/4 | 96 1/2 | 96 1/2 | — 3/8 |
| Gen. Asphalt 6s | 107 3/4 | 107 | 107 1/2 | + 3/8 |
| Gen. Petroleum 5s | 100 1/4 | 99 3/4 | 100 | + 1/8 |
| Humble Oil & Refg. 5 1/2s | 102 3/4 | 101 1/4 | 101 3/4 | + 1/4 |
| Mid-Cont. Pet. 6 1/2s | 104 1/2 | 104 1/8 | 104 1/8 | — 1/4 |
| Pan-Amer. P & T 7s | 105 1/4 | 105 1/4 | 105 1/4 | 0 |
| Pan-Amer. P & T 6s | 105 | 104 1/2 | 104 1/2 | + 1/4 |
| Pierce Oil deb 8s | 98 1/8 | 97 3/4 | 97 3/4 | —2 3/8 |
| Prod. & Refnrs. 8s | 111 1/8 | 111 | 111 1/8 | + 1/8 |
| Sinclair Con. Oil Col. 7s | 97 3/4 | 97 1/2 | 97 1/2 | — 1/4 |
| Sinclair Con. Oil Con. 6 1/2s | 91 7/8 | 91 1/8 | 91 1/8 | — 1/4 |
| Sinclair Con. Oil 6s | 100 3/4 | 100 | 100 | — 1/2 |
| Sinclair Crude Oil 6s | 100 3/4 | 100 1/4 | 100 3/8 | 0 |
| Sinclair Pipe Line sf 5s | 93 1/2 | 92 1/2 | 93 3/8 | + 1/2 |
| Superior Oil 7s | 96 | 96 | 96 | — 1/4 |
| Union Oil of Cal. 6s-A | 107 1/4 | 107 | 107 | — 1/4 |
| Union Oil of Cal. 5s-C | 98 3/4 | 98 3/8 | 98 3/4 | +1 3/8 |

Market Section

# Standard Oil Stock Traded in New York Curb Market

| 1925 High | 1925 Low | 1926 High | 1926 Low | Outstanding Capital | Par Value | Stocks | Div. Rate | Last Paid | Transactions week ended Oct. 15 Sales | First | High | Low | Last | Ch'ge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26⅝ | 17¼ | 19¾ | 16⅜ | £ 4,000,000 | £1 | Anglo American | 60¾cS.A. | May 27,26 | 1,400 | 18 | 18⅜ | 18 | 18⅜ | + ⅝ |
| ..... | ..... | 18¼ | 16½ | ..... | £1 | do ctfsnon votg | ..... | ..... | 800 | 17⅝ | 18¼ | 17⅜ | 18¼ | + ¾ |
| 4¼ | 1⅜ | 2¼ | 1⅜ (sh) | 500,000 | N.P. | Atlanti c Lobos | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 12⅜ | 3 | 5 | 3⅝ $ | 10,000,000 | $10 | do pfd | ..... | ..... | 100 | 3⅝ | 3⅝ | 3⅝ | 3⅝ | 0 |
| 240 | 205 | 301 | 226 | 1,000,000 | 100 | Borne Scrymser | $4S.A. | Oct. 15,26 | 10 | 265 | 265 | 265 | 265 | —20 |
| ..... | ..... | ..... | ..... | ..... | .... | do new | ..... | ..... | 50 | 67 | 67 | 67 | 67 | —7 |
| 72 | 53½ | 59½ | 43½ | 10,000,000 | 50 | Buckeye Pipe Line | $1Q | Sept. 15,26 | 450 | 44½ | 44½ | †43½ | 43½ | —1¼ |
| 74 | 48½ | 75¼ | 65 | 3,000,000 | $5 | Chesebrough Mfg | 75cQ | Sept. 30,26 | 100 | 73 | 73 | 73 | 73 | — ½ |
| 115 | 110 | ..... | ..... | 1,000,000 | 100 | do pfd | $1¾Q | Sept. 30,26 | ..... | ..... | ..... | ..... | ..... | ..... |
| 31½ | 21⅜ | 25⅜ | 18⅜ | 34,914,280 | 10 | Continental Oil | 25cQ | Sept. 15,26 | 10,000 | 19⅜ | 19¼ | †18⅜ | 18⅜ | — ½ |
| 17½ | 10 | 17 | 13½ | 1,500,000 | $5 | Crescent Pipe Line | ..... | Sept. 15,26 | 300 | 15½ | 15½ | 15½ | 15½ | — ¼ |
| 156 | 132 | 137 | 107½ | 3,000,000 | 100 | Cumberland Pipe Line | $3Q | Sept. 15,26 | 30 | 107½ | 108½ | 107½ | 108 | —1½ |
| 96 | 61 | 63¾ | 43½ | 5,000,000 | 100 | Eureka Pipe Line | $1Q | Aug. 2,26 | 350 | 45 | 45 | 44½ | 45 | +2½ |
| 68½ | 23½ | 32½ | 9⅜ | 16,000,000 | 100 | Galena Signal Oil | ..... | June 30,25 | 900 | 10¾ | 11½ | 10⅜ | 11½ | + ¾ |
| 105 | 88 | 94½ | 38¼ | 4,000,000 | 100 | do new pfd | ..... | June 30,26 | 70 | 41½ | 41½ | †38¼ | 38¼ | —3¼ |
| 114 | 95 | 97½ | 52 | 2,000,000 | 100 | do old pfd | ..... | June 30,26 | 10 | 52 | 52 | †52 | 52 | — ½ |
| 95 | 42¾ | 68¼ | 53½ | 72,916,650 | $5 | Humble Oil & Refining | 30cQ | Oct. 1,26 | 7,600 | 55⅝ | 56 | 54¾ | 54¾ | —1 |
| 154½ | 127 | 144½ | 131 | 20,000,000 | 100 | Illinois Pipe Line | $6S.A. | June 30,26 | 150 | 135 | 135 | 134½ | 134½ | — ½ |
| 39¼ | 27¼ | 38¾ | 31½ sh | 6,491,852 | N.P. | Imperial of Canada | 25cQ | Sept 1,26 | 3,400 | 35⅜ | 35⅜ | 34⅝ | 34¾ | — ⅛ |
| 84 | 57⅜ | 70 | 58 $ | 5,000,000 | 50 | Indiana Pipe Line | $1Q | Aug. 14,26 | 200 | 59½ | 59¾ | 59¼ | 59¼ | + ⅛ |
| 35⅜ | 22⅜ | 35½ | 28¾ sh | 7,118,138 | N.P. | International Petroleum | 25cS.A. | Aug. 15,26 | 21,900 | 32 | 32⅛ | 29⅜ | 30¼ | — ⅛ |
| 25⅜ | 16½ | 20⅜ | 13⅜ $ | 6,382,500 | $12½ | National Transit | 25 Q | Sept 15,26 | 500 | 13¾ | 13⅜ | †13⅛ | 13⅜ | — ⅛ |
| 79 | 49¼ | 51¼ | 30½ | 5,000,000 | 100 | New York Transit | ..... | July 15,26 | 150 | 31 | 31½ | 31 | 31½ | +1 |
| 88 | 67½ | 80½ | 66 | 4,000,000 | 100 | Northern Pipe Line | $3S.A. | July 1,26 | 450 | 66 | 66½ | 66 | 66 | 0 |
| 75¾ | 60¼ | 67¾ | 55¾ | 60,000,000 | $5 | Ohio Oil Co | 50cQ | Sept. 15,26 | 1,300 | 58 | 58 | 57¼ | 57½ | — ½ |
| 44½ | 19 | 24¾ | 15 | 10,000,000 | $5 | Penn Mex Fuel | ..... | May 21,25 | 1,100 | 18½ | 17½ | 17 | 17½ | + ⅜ |
| 65½ | 45⅜ | 60¼ | 48 | 60,000,000 | $5 | Prairie Oil & Gas | 50cQ | Aug 31,26 | 11,700 | 50¾ | 50¾ | 49⅜ | 50 | — ¾ |
| 129¾ | 106 | 127½ | 122¼ | 81,000,000 | 100 | Prairie Pipe Line | $2Q | July 31,26 | 400 | 124¼ | 124½ | 124¼ | 124½ | + ½ |
| 254 | 200 | 220 | 184½ | 4,000,000 | 100 | Solar Refining Co | $5S.A. | June 19,26 | 40 | 197 | 197 | 195 | 195 | —2 |
| 103 | 63 | 74½ | 24 | 10,000,000 | 100 | Southern Pipe Line Co | ..... | Mar. 1,26 | 300 | 24½ | 24½ | 24 | 24½ | + ½ |
| 47½ | 45 | 50 | 34½ | 20,000,000 | $5 | South Penn Oil Co | 37½cQ | Sept. 30,26 | 1,200 | 37 | 37 | 36 | 36 | 0 |
| 84 | 50 | 56⅜ | 49 | 3,500,000 | 100 | South West Pa. Pipe Line | $1Q | Oct. 1,26 | 600 | 52½ | *56½ | 52½ | 55½ | +4½ |
| 70¾ | 59½ | 70½ | 61½ $ | 223,756,258 | $25 | S. O. Indiana | 62½cQ | Sept. 15,26 | 28,600 | 62¾ | 63¼ | 61⅝ | 61⅞ | —1 |
| 46 | 30⅝ | 36½ | 19⅝ | 8,000,000 | $5 | S. O. Kansas | ..... | June 16,24 | 700 | 20 | 20 | 19 | 19½ | — ½ |
| 137 | 114¾ | 134⅜ | 108 | 16,864,484 | $5 | S. O. Kentucky | $1Q | Sept 30,26 | 1,500 | 119 | 119 | 116¼ | 116¼ | —1½ |
| ..... | ..... | 51⅜ | 42 | 4,518,000 | $5 | S. O. Nebraska | 63cQ | Sept. 20,26 | 1,400 | 44½ | 44½ | 43¼ | 43¾ | + ⅛ |
| 48⅜ | 40¼ | 47¼ | 30⅜ | 358,102,000 | $5 | S. O. New York | 40 Q | Sept. 15,26 | 28,600 | 31 | 31¼ | 30⅝ | 41 | + ⅜ |
| 369 | 338 | 362 | 288 | 14,000,000 | 100 | S. O. Ohio | $2½Q | Oct. 1,26 | 150 | 293 | 293 | †288 | 290 | —3 |
| 123 | 116 | 122 | 117 | 7,000,000 | 100 | do pfd | $1¾Q | Sept. 1,26 | 10 | 118¼ | 118¼ | 118¼ | 118¼ | — ¾ |
| 27 | 19 | 23 | 15¼ | 1,722,931 | $5 | Swan Finch Co | ..... | Nov. 1,19 | ..... | ..... | ..... | ..... | ..... | ..... |
| 109½ | 80⅜ | 112 | 94½ | 61,919,950 | $5 | Vacuum Oil Co | 50cQ | Sept. 20,26 | 3,700 | 95¾ | 95¼ | 94½ | 95 | 0 |

## Financial Notes

**Arkansas Natural Gas Co.**—Benedum and Trees interests are reported to have bought privately from an estate 162,829 shares of stock in this company at a price higher than prevailing market prices. Stock in the company was unusually active in the Pittsburgh market last week following publication of the report.

## Cleveland Stock Market

Oct. 8

| | Par | Bid | Asked | Last Sale |
|---|---|---|---|---|
| Canfield Oil Co | $100 | 108 | ..... | 105 |
| do pfd | 100 | ..... | ..... | 95 |
| Fred G Clark Co | 10 | 3½ | 4½ | 4 |
| National Refining Co | 25 | 39 | 42 | 39½ |
| do pfd | 100 | 133 | ..... | 133 |
| Paragon Refining Co | 25 | 7⅞ | 8 | 7¾ |
| do pfd | 100 | ..... | 82 | 80 |

xEx-dividend

## Oil Dividends

| | Amt. | Payable | Stock of Record |
|---|---|---|---|
| Skelly Oil q | 50c | Dec. 15 | Nov 15 |
| Tide Water pfd. q | $1.25 | Nov. 15 | Nov. 1 |
| North Central Texas q | 15c | Dec. 1 | Nov. 10 |
| Union of Calif. q | 5 0c | Nov. 10 | Oct. 16 |
| United Oil q | 75c | Oct. 15 | Oct. 5 |

## New York Curb Market

| 1925 High | 1925 Low | 1926 High | 1926 Low | Par Value | Stocks | Transactions week ended Oct. 15 Sales | First | High | Low | Last | Ch'ge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11½ | 2½ | 14½ | 4¼ | $ 5 | Amer. Maracaibo | 100 | 4¾ | 4¾ | 4¾ | 4¾ | 0 |
| 8⅜ | 5 | 8⅜ | 5¼ | $10 | Arkansas Nat. Gas. | 100 | 7½ | 7⅜ | 7½ | 7⅜ | + ⅛ |
| ..... | ..... | 19⅜ | 14⅛ | N.P. | Beacon Oil | 1,000 | 18½ | 18½ | 17⅛ | 17¼ | —1 |
| 47½ | 38 | ..... | ..... | $25 | British-American | ..... | ..... | ..... | ..... | ..... | ..... |
| 10¼ | 2¾ | 2?7¼ | 9¼ | 25c | Carib. Syndicate | 13,700 | 17½ | 17½ | 16¼ | 16¾ | —1⅛ |
| 43 | 35 | 45⅞ | 37½ | $20 | Cities Service | 14,900 | 45 | *45⅞ | 44¾ | 45⅜ | + ¼ |
| 85⅜ | 80¼ | 8:⅜ | 82¾ | 100 | do pfd | 1,800 | 89½ | 89½ | 89 | 89⅛ | — ⅜ |
| 8 | 7¼ | 7⅞ | 7⅜ | 10 | do pfd. B | 100 | 7⅞ | 7⅞ | 7⅜ | 7⅜ | 0 |
| 21¾ | 17½ | 22½ | 19 | 10 | do bankers' sh | 200 | 22½ | 22½ | 22½ | 22½ | 0 |
| 2¾ | .60 | 3½ | 2 | N.P. | Colombia Syndicate | 9,700 | 2 1/16 | 2⅜ | 2⅛ | 2 1/16 | — 1/16 |
| 15 | 8¼ | 16 | 10 | N.P. | Creole Syndicate | 7,800 | 13½ | 13½ | 12¾ | 13 | — ⅝ |
| 12¼ | 5 | 7⅛ | 1⅛ | N.P. | Crown Central | 3,100 | ..... | 1½ | 1¼ | 1¼ | 0 |
| 7 | 2 | 4 | 1 1/16 | N.P. | Derby Oil & Ref | ..... | ..... | ..... | ..... | ..... | ..... |
| 27 | 10½ | 19 | 13 | N.P. | do pfd | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | 2¼ | 60 | | Euclid Oil | 22,200 | 1 1/16 | 1 1/16 | †.60 | 1 | — 1/16 |
| 6 | 1⅜ | 7½ | 3 | N.P. | Gibson Oil | 23,400 | 3⅛ | 3¼ | † 3 | 3⅛ | — ⅛ |
| 3¾ | 1⅛ | 2 | .63 | N.P. | Gilliland v.t.c | ..... | ..... | ..... | ..... | ..... | ..... |
| 98½ | 63½ | 95 | 82 | $25 | Gulf Oil Corp | 2,700 | 90⅝ | 90⅝ | 89½ | 89¾ | — ¾ |
| 5⅞ | 2¼ | 4 | 1½ | N.P. | Kirby Petroleum | 200 | 1½ | 1½ | 1½ | 1½ | 0 |
| 13 | 6 | 12¼ | 5¾ | N.P. | Leonard Oil & Dev. | 3,400 | 7¾ | 7¾ | 7½ | 7⅝ | — ⅛ |
| 25⅞ | 18 | 25¾ | 20 | N.P. | Lion Oil Refining | 7,900 | 21¾ | 21¾ | 20½ | 20⅞ | — ¼ |
| ..... | ..... | 46 | 31½ | $25 | Lone Star Gas | 2,100 | 44⅞ | 46 | 44⅞ | 45⅜ | +1⅛ |
| 4½ | 1¾ | 3⅜ | 2 | N.P. | Mariand of Mexico | ..... | ..... | ..... | ..... | ..... | ..... |
| 5¾ | .56 | 5½ | 2⅜ | $10 | Mexican-Panuco | 11,200 | 3 | 3¼ | † 2⅜ | 2¾ | — ⅛ |
| 2 | 1 | 1¾ | 1⅛ | 1 | Mountain & Gulf | ..... | ..... | ..... | ..... | ..... | ..... |
| 26¼ | 18¾ | 26 | 22½ | 10 | Mountain Prod | 5,400 | 24 | 24 | †22½ | 22½ | —1½ |
| 6¾ | 3⅜ | 6¾ | 5¼ | 5 | New Bradford | 600 | 5¾ | 5¾ | † 5¼ | 5¾ | — ¼ |
| 24¾ | 16¼ | 11¾ | 2 | 10 | New En land Fuel | 100 | 5½ | 5½ | 5½ | 5½ | 0 |
| 19¾ | 6¼ | 17 | 9⅛ | 1 | New Mex. & Ariz | 2,000 | 10¼ | 10¼ | 9¾ | 9¾ | — ⅛ |
| 12½ | 8¼ | 17 | 8 | $5 | New York Oil | ..... | ..... | ..... | ..... | ..... | ..... |
| 37 | 14 | 36 | 34½ | $5 | Ohio Fuel Corp | ..... | ..... | ..... | ..... | ..... | ..... |
| ..... | ..... | 9⅞ | 6¼ | .... | Pandem | 2,900 | 7 | 7 | 6⅝ | 6⅞ | + ⅛ |
| 2½ | .90 | 2¾ | .50 | N.P | Peer Oil Corp | ..... | ..... | ..... | ..... | ..... | ..... |
| 28¼ | 16 | 22¾ | 13¾ | $10 | Pennok Oil | 100 | 13⅞ | 13⅞ | 13⅞ | 13⅞ | 0 |
| 44½ | 16 | 38 | 14⅛ | $5 | Red Bank Oil | 200 | 24¼ | 24¾ | 24 | 24 | —2 |
| 33½ | 19 | 28¾ | 14½ | N.P. | Reiter-Foster | 2,500 | 16½ | 16½ | 16 | 16 | — ¼ |
| ..... | ..... | 27½ | 25 | $25 | Richfield Oil w i | 200 | 25¾ | 25¾ | †25 | 25 | — ¾ |
| 9½ | 8½ | 7½ | 4⅝ | N.P. | Ryan Consolidated | 900 | 5 | 5 | 4⅝ | 5 | — ⅛ |
| 9¾ | 6⅛ | 10 | 8 | $10 | Salt Creek Cons | 800 | 8⅛ | 8¾ | 8⅛ | 8¼ | + ¼ |
| 35 | 24 | 36 | 28⅞ | 10 | Salt Creek Prod | 1,700 | 30 | 30 | 29¾ | 29¾ | — ⅛ |
| 3⅞ | 1 | 4 | 1⅛ | 5 | Savoy Oil | ..... | ..... | ..... | ..... | ..... | ..... |
| 13¾ | 9 | 25 | 7⅜ | 10 | Tidal Osage | 8,200 | 21¾ | 24 | 19½ | 24 | —2½ |
| 10⅜ | 8 | 22⅜ | 8¼ | 10 | do non-voting | 6,600 | 19½ | 21 | 19½ | 20½ | —2 |
| ..... | ..... | 27 | 21 | N P. | Tide Water Assoc | 6,500 | 22⅛ | 22¼ | 21⅛ | 22 | 0 |
| ..... | ..... | 99¼ | 97½ | 100 | " " " pfd. | 1,200 | 97½ | 97½ | 97½ | 97½ | 0 |
| 4⅞ | 1¾ | 8 | 4¼ | 5 | Venezuelan Pet | 6,800 | 5⅜ | 5⅝ | 5⅜ | 5½ | 0 |
| ..... | ..... | 29¾ | 23½ | N P | Warner-Quinlan | 700 | 25¾ | 25¾ | 25 | 25 | —1½ |
| 81¼ | 22½ | 86⅛ | 22 | N P. | Wilcox O & G new | 900 | 26⅛ | 26⅞ | 26¼ | 26¼ | — ¼ |
| 7 | 2?4 | 9½ | 4¼ | 81 | Woodle Petroleum | 1,200 | 7⅝ | 7⅝ | 7 | 7½ | — ¼ |

*New High †New Low xEx-Dividend.

## High Per Ton Prices Bid For U. S. Tankers

WASHINGTON, Oct. 18.—An almost war-time bulge in the price of tank ships was shown in bids running as high as $68 per dead weight ton, submitted to the United States Shipping Board by oil companies. Heretofore the best price has been about $45. Just why prices have gone so high is not known. The tankers up for bids were the Cecil County, 10,254 dead weight tons; Hoven, 10,387 tons; Hempton Roads, 10,254 tons; and the District of Columbia, 10,250 tons.

The ships were offered, all except the Hoven, as steamers for Dieselization. The Hoven was offered as a steamer only.

It is estimated that it will cost from $400,000 to $450,000 to convert a tanker from steam to Diesel and more to electric propulsion.

The sale of these ships is in accordance with the plan of the Shipping Board to get out of the merchant marine business. When these tankers, now under charter, are sold the Board will have only seven of its large tanker fleet left.

## S. O. Of Indiana Reduces Kerosene Tank Wagon

CHICAGO, Oct. 18.—Effective Oct. 13, Standard Oil Co. of Indiana reduced the tank wagon price of kerosene 1 cent throughout its marketing territory. The price revision did not affect gasoline. A bulletin to this effect was carried in last week's issue of National Petroleum News but corrected prices appear in the tank wagon table in this issue.

Since the middle of August three special price revisions have taken place in Standard of Indiana territory affecting gasoline. The first change occurred on Aug. 19 at Sioux City, Ia., when a 2.1 cent downward revision was made. The second was at Grand Forks, N. D., on Sept. 11 when gasoline was cut 2.2 cents. Both of the above changes were due to local price disturbances and affected the city only and not surrounding territory.

Effective Oct. 1, the city tax imposed on gasoline by St. Joseph, Mo., was increased from ¼ cent to 1 cent, and gasoline was advanced ½ cent to cover the additional tax on that date.

---

LIMA, O.—The Chilcote Oil & Gas Co., Inc. of Lima, is one of the small companies formed last year. It brought in its first well in July of this year. The well pumped 15 barrels in 12 hours. The second well, completed late in September, made 40 barrels in 12 hours. Both wells are in Sec. 7, Van Wert county. The company is continuing development on its 400-acre lease.

# THE OIL INDUSTRY EXCHANGE

### *Positions Wanted*

**SALES MANAGER**; mechanical engineer, 16 years' experience in manufacturing and sale of machinery and engineering material. Successful training and working salesmen and road service men. Have had exceptional training and experience, merchandising and engineering lubricating oils Broad acquaintance with manufacturers of Middle West, especially Detroit motor trade and steel manufacturers. Open for engagement January 1st. Box 714.

Young man, married, fifteen years' experience as **TRAFFIC MANAGER** for one of major independents, desires connection same capacity with some growing oil company in southwest. Thoroughly competent to take charge established traffic department or start new one Best reasons for leaving present position Address Box 713, care National Petroleum News.

**SALESMAN** with large acquaintance among Petroleum marketers of Illinois and Wisconsin, experienced selling equipment and lubricating oils solicits correspondence with equipment manufacturer or Pennsylvania Oil refiner looking for representation in above mentioned territory. R E RYAN, 1413 FISHER BLDG., CHICAGO, ILL.

**Sludge Acid Recovery.** Man thoroughly familiar with construction and operation, bottles to hot air concentration, desires connection. Box 685.

**GRADUATE CHEMIST**; married; nine years' experience in oil refineries; light and heavy oils including lubricating oils. Available at once. Box 711.

YOUNG MAN—With over 12 years' experience in Petroleum Industry as Export and Domestic Sales Manager, Buyer, Broker and Market r, desires to affiliate with organization where hard work and ability will be amply rewarded Can make small investment if necessary.

Box 715

### *Situations Open*

**EXPERIENCED OIL REFINERY DESIGNING AND MECHANICAL ENGINEER WANTED.** Address Box 706 care this publication.

LUBRICATING SALESMAN WANTED

To call on jobbing trade in states of Iowa and Nebraska. Must be honest, capable, energetic Prefer man acquainted with territory although this qualification not imperative. Give experience, past employment and complete qualifications, which will be held confidential. Box 717

### *Miscellaneous*

**WHAT IT COSTS**

**For "Position Wanted" advertisements—5 cents per word Minimum cost $1.00 All other classified advertising—10 cents per word Minimum cost $3.00 Advertisements set in special type or with border—$4.00 per column inch. Copy must reach us not later than Friday preceding date of issue**

**All advertisements carried on this page are payable in advance**

**Advertisers having box numbers should be addressed in care of National Petroleum News, 817 Huron road, Cleveland, Ohio, unless otherwise specified.**

### *Wanted—To Buy*

HORSE DRAWN TANK WAGON WANTED

of capacity 350 to 600 gallons. Must be in useable condition.

Box 718

6 INCH PIPE WANTED

7,000 to 8 000 feet 6 inch pipe and Standard Fittings. Quote F. O. B. New Orleans.

Address: "Pipe," Room 916, 342 Madison Ave., New York City

**"Used Equipment Wanted"**

**Don't wait until you see an advertisement like this before trying to sell that truck, machinery or other equipment which you are no longer using.**

**Turn it into cash now, by inserting a "for sale" advertisement on this page where prospective buyers will be looking for it.**

**Copy received before Saturday noon can be carried in Wednesday's issue.**

### *For Sale*

**WELL-ESTABLISHED FIVE BULK STATIONS AND O.L JOBBING BUSINESS FOR SALE** in best part of Wisconsin Selling close to three million gallons annually. Address Box 719

FOR SALE

1-No. 9 and 1-No. 10 Sweetland Filter Press, very reasonable. Also 20-8000 gallon tank cars, center anchored. Acme Oil Corporation 189 No. Clark St., Chicago, Ill.

## Classified Advertising

Will get results for you. It will locate sales-managers, filling station attendants, grease-makers, or any oil men you may need.

Market Section

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